LA BREA TAR PITS MASTER PLAN

FINAL ENVIRONMENTAL IMPACT REPORT

JANUARY 2025

SCH NO. 2022020344

Volume II Appendices

LEAD AGENCY: COUNTY OF LOS ANGELES

PREPARED BY: SWCA ENVIRONMENTAL CONSULTANTS
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LA BREA TAR PITS & MUSEUM

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LEAD AGENCY: County of Los Angeles

PROJECT PROPONENT: Los Angeles County Museum of Natural History Foundation on behalf of the County of Los Angeles Museum of Natural History
900 Exposition Boulevard, Los Angeles, CA 90007
Contact: Leslie Negritto, Chief Operating Officer

PREPARED BY: SWCA Environmental Consultants
320 North Halstead Street, Suite 120, Pasadena, CA 91107
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Contact: Bobbette Biddulph, SWCA Project No. 63953

APPENDIX A

Notice of Preparation and Summary Comment Matrix

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND PUBLIC SCOPING MEETING

DATE: February 14, 2022

TO: Governor's Office of Planning and Research State Clearinghouse, Responsible Agencies, Trustee Agencies, Organizations, and Interested Parties

LEAD AGENCY: County of Los Angeles

PROJECT PROPONENT: Los Angeles County Museum of Natural History Foundation
900 Exposition Boulevard, Los Angeles, CA 90007

SUBJECT: Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting for the **Proposed La Brea Tar Pits Master Plan Project**

The County of Los Angeles (County) is the lead agency pursuant to the California Environmental Quality Act (CEQA) and intends to prepare an Environmental Impact Report (EIR) for the proposed La Brea Tar Pits Master Plan Project (project). The County has prepared this notice of preparation (NOP) to provide responsible agencies, trustee agencies, organizations, and other interested parties with information describing the project and to identify the project's probable environmental effects pursuant to State of California requirements. The County seeks input from responsible agencies, trustee agencies, other affected public agencies, the public, and others regarding the scope and contents of the EIR.

The La Brea Tar Pits and the George C. Page Museum (Page Museum), located in portions of the 23-acre Hancock Park, including buildings, facilities, recreation areas, and the tar pits, are owned by the County but are managed by the non-profit Los Angeles County Museum of Natural History Foundation (Foundation). The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the Natural History Museums of Los Angeles County (NHMLAC), including the La Brea Tar Pits and Page Museum.

PROJECT LOCATION AND OVERVIEW

As shown in Figures 1 and 2, the La Brea Tar Pits Master Plan property (project site) is located at 5801 Wilshire Boulevard in the Miracle Mile neighborhood of Los Angeles. The 13-acre project site occupies the eastern and northeastern portions of the 23-acre Hancock Park. The project site broadly encompasses what is known as the La Brea Tar Pits, which includes the Page Museum; the physical tar pit features located within the Hancock Park grounds, some of which are

research sites; the concession and public restroom building; a multipurpose lawn, recreation areas, and landscaped features throughout the park; and a surface parking lot.

The Los Angeles County Museum of Art (LACMA) is adjacent to the project site and also partially within Hancock Park; LACMA's facilities are not included in the project.

The La Brea Tar Pits Master Plan site is bounded by Wilshire Boulevard to the south, West Sixth Street to the north, South Curson Avenue to the east, and LACMA to the west. Also located to the west and just beyond LACMA's facilities are the Academy Museum of Motion Pictures and South Fairfax Avenue.

PROJECT DESCRIPTION

The proposed project would renovate the existing Page Museum and add a new one-story museum building toward the northwest, increasing the total museum square footage from 63,000 gross square feet (gsf) to 105,000 gsf (Figure 3). The new museum building would include a lobby and exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock.

The renovation of the Page Museum would remove the vegetation in the existing central atrium and improve the facility to allow for additional exhibition, classroom, and laboratory spaces. The renovation would also allow much of the collection space to be reorganized and enlarged to provide better display of the collections to the public. As part of the project, a café could be added to the outdoor terrace on the western side of the Page Museum.

The existing parking lot would be shifted to the northeast. However, it is not anticipated that there would be a substantial change in the amount of parking provided. The project would add new landscaping and vehicle access lanes to the parking lot, with an additional pedestrian entrance to the museum leading from the parking lot. A new 2,000-gsf support building would be constructed for additional exhibit, presentation, storage, administration, and research space directly west of the parking lot.

The project would add the following improvements to Hancock Park: a pedestrian path (improving pedestrian circulation within the project site), additional seating and rest areas, a Wilshire Gateway entry plaza at the southeastern corner of the site, a 6th Street Gateway entry plaza at the northwestern corner of the site, a pedestrian bridge over the Lake Pit, three pavilions with canopies, and new and enhanced recreation areas. Enhanced landscaping would also be provided, including native vegetation plantings and a garden bioswale to improve stormwater infiltration.

The phasing and the timing of construction to be proposed is currently under study by the NHMLAC and will be further detailed in the EIR. However, it is expected that construction would be completed in approximately 7 to 10 years. Construction activity is not anticipated to occur consistently over this duration, but rather would

be phased as funding becomes available. Limiting construction impacts to the community will be an important consideration in the determination of the final construction plan.

PROBABLE ENVIRONMENTAL EFFECTS OF THE PROJECT

Based on a preliminary review of the proposed project and consistent with Section 15060(d) of the CEQA Guidelines, the County has determined that a comprehensive EIR will be prepared for the project. Therefore, all of the topics identified in Appendix G of the CEQA Guidelines (the initial study checklist) will undergo study in the EIR.

The environmental effects to be analyzed in the EIR will include, but are not limited to, the following:

Transportation: A transportation impact analysis will be prepared for the EIR to describe the existing local and regional transportation network and to evaluate the proposed project's construction-related and operations-related traffic impacts for vehicular, transit, bike, and pedestrian circulation. The EIR will analyze whether the project would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities. The project's impacts to traffic and transportation and their level of significance will be assessed in detail in the EIR.

Paleontological Resources: Hancock Park and the La Brea Tar Pits were designated as a National Natural Landmark in 1962, due to the world-famous asphalt tar pits and because of the site's important history related to Pleistocene animal fossils. The site is recognized for having the largest and most diverse assemblage of extinct plants and animals in the world and continues to support active discovery and research related to the asphalt tar pits. Subsurface paleontological resources could be discovered during construction of project components, particularly during excavation for construction of the new museum building. The potential for impacts to paleontological resources will be evaluated in the EIR and appropriate discovery and treatment measures will be developed and presented in the EIR.

Cultural Resources: The EIR will provide an assessment of the potential effects of the project on cultural resources. The EIR will include an inventory of archaeological, historic, and culturally sensitive resources and will describe the potential for cultural resources to be adversely impacted during construction or operation of project components, particularly during excavation for the construction of the new museum building. Consideration will be given to the potential for effects on the historic sensitivity of the project site and its features. Specifically, Hancock Park and the La Brea Tar Pits were designated as eligible for listing in the National Register of Historic Places in 1984.

Tribal Cultural Resources: In accordance with Assembly Bill 52 (Government Code Section 65352.4), the Native American Heritage Commission and any tribes it identifies will be contacted and consulted about the presence of traditional lands or cultural places in the proposed project vicinity; potential impacts to tribal cultural resources will be identified in the EIR.

Air Quality: Construction of the project would generate emissions from construction equipment exhaust, earth movement, construction workers' commutes, and material hauling. The EIR will provide an estimate of construction-related emissions as well as long-term operational emissions of project components. The EIR will also provide an evaluation of the project's consistency with regional air quality attainment plans and the potential health impacts associated with project construction and operation emissions to local and regional sensitive receptors.

Greenhouse Gas Emissions: The EIR will provide a quantification of greenhouse gas emissions associated with proposed construction and operation in terms of carbon dioxide equivalent emissions. The estimated greenhouse gas emissions will be compared to regional thresholds of significance and impacts will be identified. The proposed project's consistency with the County's Community Climate Action Plan and other applicable plans will also be addressed.

Noise: The EIR will identify sensitive noise receptors and sources of noise and vibration in the project area and will analyze short-term construction and long-term operational noise and vibration impacts, where feasible. The construction analysis will use established modeling methods (e.g., the Federal Highway Administration Roadway Construction Noise Model and the Federal Transit Administration Noise and Vibration Manual). The EIR will provide an analysis of the project's potential to generate substantial temporary or permanent increases in ambient noise levels near the project in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.

Geology and Soils: The EIR will provide an analysis of geologic hazards, including the potential for seismic hazards, such as rupture of a known earthquake fault, seismic ground shaking, or seismic-related ground failure, including liquefaction, landslides, substantial erosion or the loss of topsoil, lateral spreading, subsidence, collapse, and expansive soils.

Hazards and Hazardous Materials: The project site is not located on a list of hazardous waste sites compiled pursuant to Government Code Section 65962.5 (i.e., the Cortese List). However, further analysis of hazardous materials will occur to support the EIR. The EIR will describe the existing hazardous materials conditions on and adjacent to the project site, including the potential for existing soil or groundwater contamination, and will identify hazardous impacts from both construction and operations. Specifically, the EIR will analyze whether the project

would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

NOTICE OF SCOPING MEETING

The County will conduct two virtual public scoping meetings to solicit oral and written comments from interested parties as to the appropriate scope and content of the EIR.

All interested parties are invited to attend one of the scoping meetings to assist with identifying issues to be addressed in the EIR. Both scoping meetings will include a brief presentation of the project to be addressed in the EIR and will provide attendees with an opportunity to provide input on the scope of the EIR. Each scoping meeting will provide the same presentation. Participants that register will be able to join either meeting. The following meeting start times are available:

- **Wednesday, March 2, 2022, 2:30 p.m.**
- **Wednesday, March 2, 2022, 5:30 p.m.**

To join at either of these times, please register at the following link to receive the Zoom connection information:

https://swca.zoom.us/webinar/register/WN_LgiNknH7StmHTjCCZAP0Yg

Live language interpretation of the presentation and scoping meeting input will be provided in Spanish and Korean during the scoping meeting. Interpretation in other languages can be made available at the meeting upon request. Please submit interpretation requests at least 7 business days in advance of the meeting date to Richard Hayden at reimagine@tarpits.org.

PUBLIC REVIEW PERIOD

The County has made this NOP available for public review and comment pursuant to the CEQA Guidelines Section 15082(b). The County is seeking input from public agencies and members of the public on the intended scope and contents of the environmental information and analysis in the EIR. Due to the time limits mandated by state law, written comments must be sent via United States Postal Service or email within 30 days, postmarked or emailed no later than **5:30 p.m. Pacific Time on Wednesday, March 16, 2022**.

Any comments provided should identify specific topics of environmental concern and the reason for suggesting the study of these topics in the EIR. All comments will be considered in defining the scope of the EIR in accordance with State and County environmental guidelines.

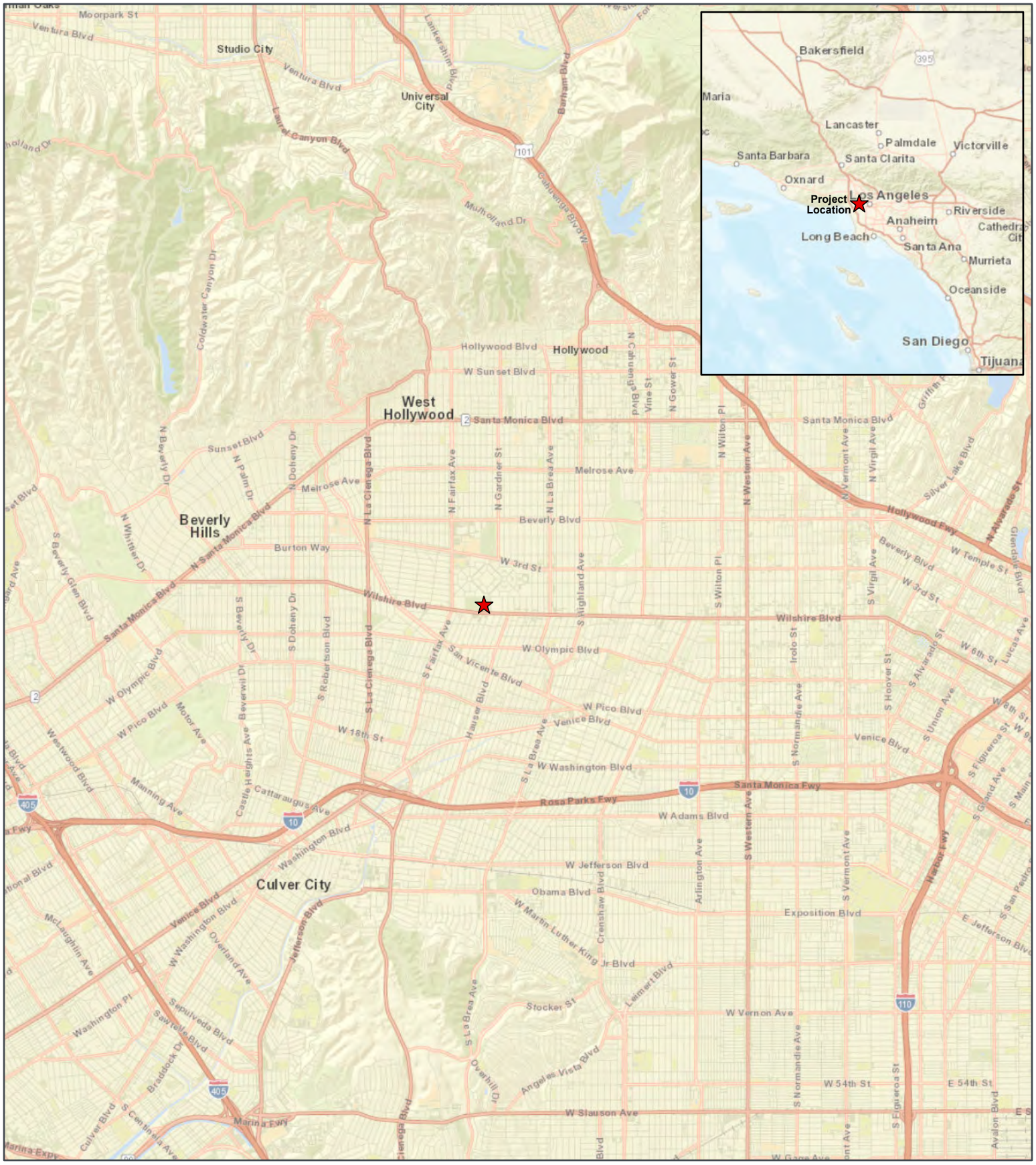
Please direct all written comments to the following address:

Richard Hayden, Assistant Deputy Director
Natural History Museums of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007
reimagine@tarpits.org

DOCUMENT AVAILABILITY

This NOP and additional information regarding the La Brea Tar Pits Master Plan Project is available for review at **tarpits.org/reimagine**

Thank you for your participation in the environmental review of this project.



LA BREA TAR PITS MASTER PLAN

Vicinity Map
Figure 1

★ Project Location

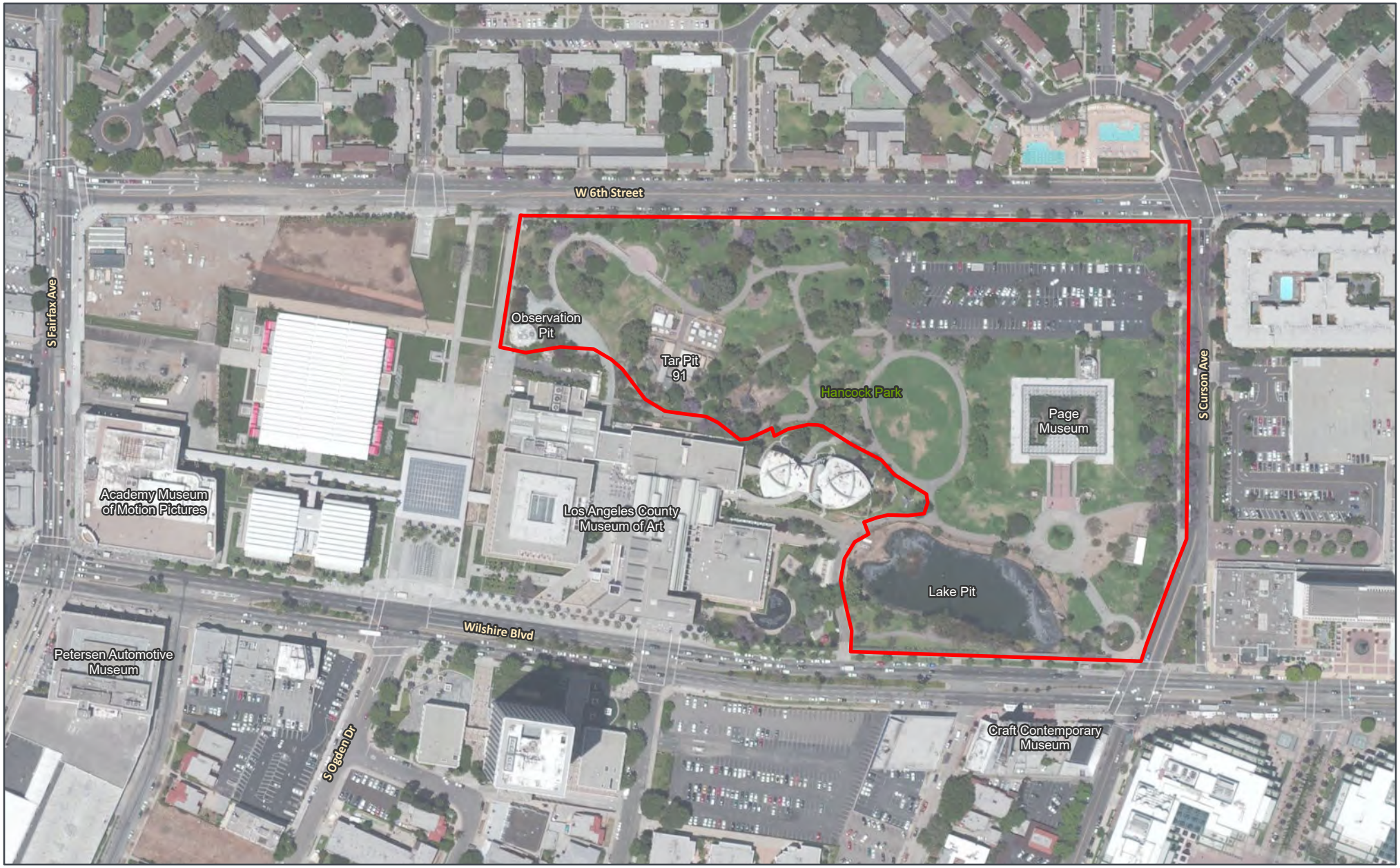
Los Angeles County, CA
WGS 1984 Web Mercator
Auxiliary Sphere
34.067°N 118.3497°W

0 4,000 8,000 Feet
0 1,000 2,000 Meters

N

1:100,000

Base Map: ESRI ArcGIS Online, accessed February 2022
Updated: 2/2/2022
Project No. 63953
Aprx: 63953_La_Brea
Layout: 63953_LaBrea_Vicinity



LA BREA TAR PITS MASTER PLAN

Location Map
Figure 2

Project Area

Los Angeles County, CA
NAD 1983 UTM Zone 11N
34.0637°N 118.3576°W

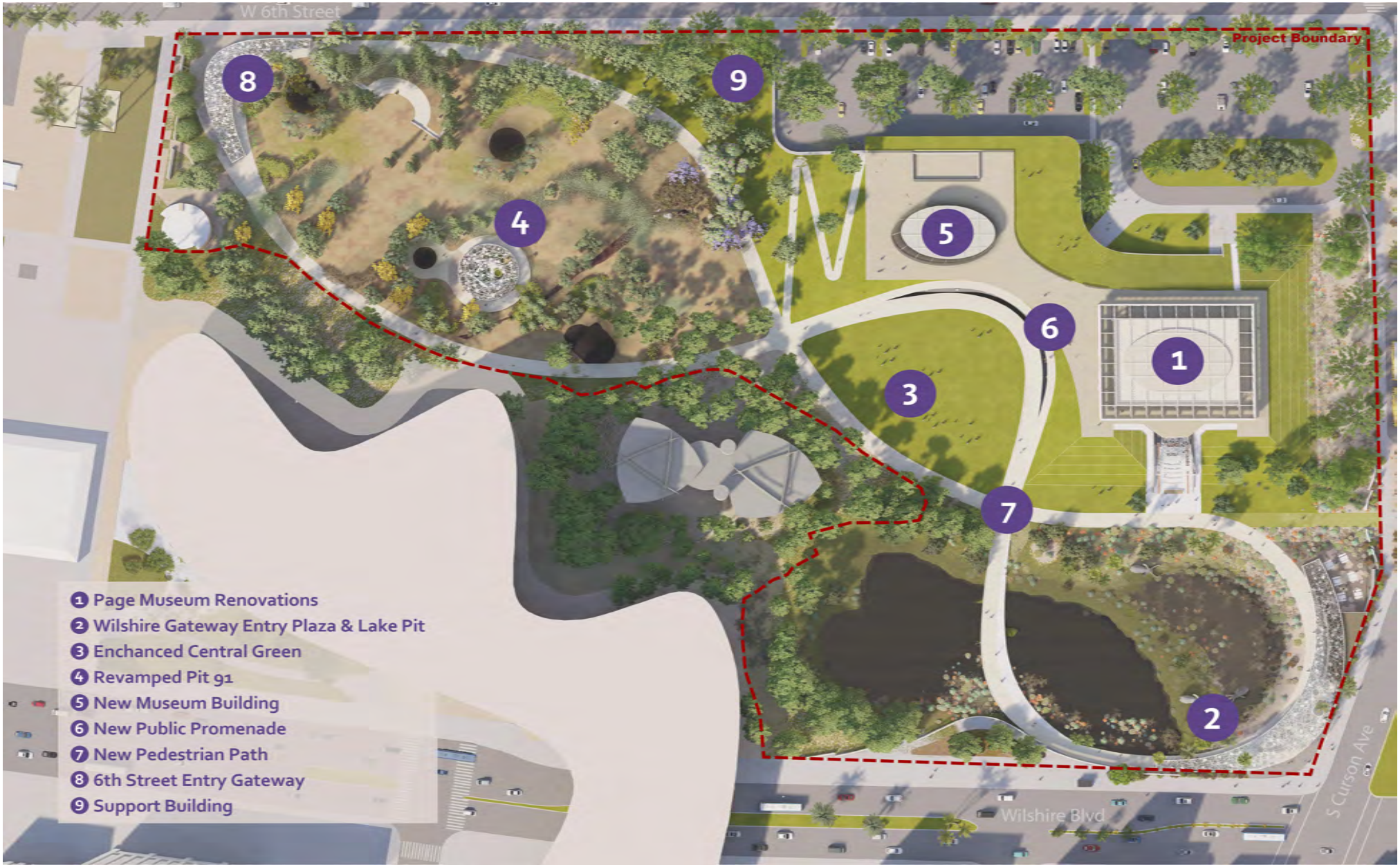
0 110 220 Feet
0 25 50 Meters

N

1:2,850

Base Map: ESRI ArcGIS Online, accessed February 2022
Updated: 2/2/2022
Project No. 63953
Layout: 63953_LaBrea_Location
Aprx: 63953_La_Brea

SWCA



LA BREA TAR PITS MASTER PLAN

Conceptual Site Plan
Figure 3

Los Angeles County, CA
34.0637°N 118.3576°W

N

Base Map: Weiss/Manfredi, 2021
accessed February 2022
Updated: 2/2/2022
Project No. 63953
Layout: 63953_LaBrea_SitePlan
Aprx: 63953_La_Brea

SWCA

La Brea Tar Pits Master Plan EIR
Summary Matrix of Written Comments on the NOP and Verbal Comments from Public Scoping Meetings

Broad Topic	Comment Summary	Type	Date of Comment	EIR Section
Tribal Cultural Resources	Comment letter includes information about compliance with Assembly Bill 52, Senate Bill 18, and tribal consultation.	AGENCY	2/16/2022	Section 5.14: Tribal Cultural Resources
Recreational Amenities	Commenter supports inclusion of a children's playground within the project site.	INDV	2/17/2022	Not a comment on environmental impact analysis.
Construction	Commenter asked about timing and length of construction activities.	INDV	02/21/2022; 2/23/2022	Chapter 3: Project Description
Construction; Design	Commenter asked about length of construction activities. Commenter suggests the museum create a "hall of La Brea" to showcase resources found on site and a "bird hall" to showcase bird fossils found on site.	INDV	2/22/2022	Chapter 3: Project Description Not a comment on environmental impact analysis.
Public Scoping	Commenter asked about timing and registration of public scoping meeting.	INDV	2/24/2022	Chapter 1: Introduction
Design	Commenter requests the museum design "reference other tar pits of the world" and other fossil localities in California.	INDV	2/25/2022	Not a comment on environmental impact analysis.
Landscaping; Design; Public Transit; Lighting	Commenter requests native and drought-conscious landscaping. Commenter is interested in further details regarding the design of the Lake Pit pedestrian bridge. Commenter encourages bicyclist accessibility and parking. Requests more public transit accessing the site, notably the Metro 720 express bus line. Commenter expressed concern regarding light pollution coming from the site.	INDV	3/2/2022	Chapter 3: Project Description The design of a possible pedestrian bridge over the Lake Pit is at the conceptual stage only and no further details are discussed in the EIR. Section 5.13: Transportation Section 5.1: Aesthetics
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/3/2022	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/3/2022	Not a comment on environmental impact analysis; however, the

Broad Topic	Comment Summary	Type	Date of Comment	EIR Section
				project does include a possible small dog park.
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/3/2022	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Recreational Amenities	Commenter discourages inclusion of a dog park within the project site, supports focus on the "science, sustainability, and general park space."	INDV	3/4/2022	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Recreational Amenities	Commenter discourages inclusion of a dog park within the project site due to odor and nuisance.	INDV	3/4/2022	The project does include a possible small dog park. Section 5.2 Air Quality (re: Odor impact analysis)
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/4/2022	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Lighting; Landscaping; Public Transit	Commenter requests a meeting with NHM staff to discuss design. Commenter expresses concern regarding light pollution, supports replacement of trees, and expresses support for current efforts to improve public transportation/circulation and pedestrian pathways in the vicinity.	INDV	3/9/2022	Section 5.1: Aesthetics, Section 5.3: Biological Resources, and Section 5.14: Transportation
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/10/2022	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/10/2022	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/11/2022	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Recreational Amenities	Commenter supports inclusion of a dog park within the project site.	INDV	3/12/2022	Not a comment on environmental impact analysis; however, the

Broad Topic	Comment Summary	Type	Date of Comment	EIR Section
				project does include a possible small dog park.
Biological Resources; Landscaping	Comment letter states Monarch Butterfly meets CEQA definition of threatened or endangered species; recommends survey, analysis, and mitigation. Comment notes potential for nesting birds on site; recommends avoidance and mitigation measures. Comment recommends DEIR contain landscaping plan and replacement tree species list. Project should include only native species. Comment recommends inclusion of infectious tree disease management plan or pest management mitigation measures. Comment recommends DEIR discuss rodenticide use. DEIR should contain biological baseline assessment.	AGENCY	3/14/2022	Section 5.3: Biological Resources
Public Transit, Transportation	Comment letter recommends DEIR include information/analysis on existing and planned transit services and facilities in the project vicinity. Comment recommends transit-oriented planning and design, provides recommendations and resources.	AGENCY	3/16/2022	Section 5.14: Transportation
Air Quality	Comment letter provides input on the content and format of the air quality and greenhouse gas analyses.	AGENCY	3/15/2022	Section 5.2: Air Quality
Design, Historic Resources	Comment letter recommends comprehensive analysis of impacts to historic resources and inclusion of historic preservation objectives and goals. Comment requests additional coordination with the project team.	ASSOCIATION	3/16/2022	Section 5.5: Cultural Resources, Historical Resources

Broad Topic	Comment Summary	Type	Date of Comment	EIR Section
Landscaping; Design; Lighting Recreational Amenities	Comment letter provides input on the design of the pedestrian pathways and landscaping of the project. Comment expresses concern regarding removal of trees, the re-conception of the Space Frame and Frieze around the interior atrium, and light pollution. Comment supports inclusion of a dog park on the project site.	ASSOCIATION	3/17/2022	Chapter 3: Project Description, Section 5.1: Aesthetics, and Section 5.3: Biological Resources
Landscaping; Design; Lighting	Commenter appreciates the open space of the project site and emphasizes retaining trees on site. Recommends planting native trees for shade over pedestrian pathways. Comment expresses concern regarding light pollution.	INDV	3/17/2022	Section 5.1: Aesthetics, and Section 5.3: Biological Resources
Landscaping; Design	Commenter expresses appreciation for the existing style/architecture of the Page Museum. Commenter notes the sump pump on northwest side of the building isn't working and the pedestrian walkways need to be resurfaced. Commenter appreciates the landscape art (Mammoth/Mastodon statues) and Amphitheater. Commenter states removing any trees on site would be unfortunate.	INDV	3/30/2022	Section 5.3: Biological Resources (re: tree removal)
Design	Comment supports inclusion of a dog park on the project site.	INDV	3/2/22	Not a comment on environmental impact analysis; however, the project does include a possible small dog park.
Design	Commenter requests expanded park hours.	INDV	3/2/22	Not a comment on the environmental impact analysis. Not addressed in the EIR.
Design	Commenter interested in further details regarding the design of the Lake Pit pedestrian bridge.	INDV	3/2/22	The design of a possible pedestrian bridge over the Lake Pit is at the conceptual stage only and no further details are discussed in the EIR.

Broad Topic	Comment Summary	Type	Date of Comment	EIR Section
Biological Resources; Landscaping	Commenter expresses information about tree removal and replacement.	INDV	3/2/22	Section 5.3: Biological Resources
Biological Resources	Commenter expresses support for rabbit population in the park.	INDV	3/2/22	Not a comment on the environmental impact analysis. Not addressed in the EIR.
Lighting	Commenter expresses concern regarding light pollution.	INDV	3/2/22	Section 5.1: Aesthetics
Bike Accessibility	Commenter inquired about bike accessibility within the park pathways.	INDV	3/2/22	Section 5.14: Transportation
Security	Commenter asks about security measures being considered as part of the project.	INDV	3/2/22	Not a comment on the environmental impact analysis. Not addressed in the EIR.
Design	Commenter asks about changes to the content of the exhibits.	INDV	3/2/22	Chapter 3: Project Description
Design	Commenter asks for details regarding the proposed change in museum size and footprint.	INDV	3/2/22	Chapter 3: Project Description
Cumulative Construction Impacts	Commenter asks about impacts of other nearby construction projects.	INDV	3/2/22	Chapter 4: Environmental Setting
Parking and Traffic	Commenter inquires about parking spaces and school bus access. Commenter also asks about traffic impacts.	INDV	3/2/22	Section 5.14: Transportation
Design	Commenter asks about plans to alter the lake pit.	INDV	3/2/22	Chapter 3: Project Description
Design	Commenter asks if park will expand in size.	INDV	3/2/22	Not a comment on the environmental impact analysis. However, for informational purposes it is noted that Chapter 3: Project Description describes all the components of the proposed Master Plan. Expansion of the park is not included in the proposed project.

APPENDIX B

La Brea Tar Pits Loops and Lenses Master Plan and Concept Design Summary Booklet

Master Plan and Concept Design
March 2023

La Brea Tar Pits
Loops and Lenses

Prepared by **WEISS / MANFREDI** for the Natural History Museums of Los Angeles County

Master Plan and Concept Design
March 2023

La Brea Tar Pits
Loops and Lenses

Prepared by **WEISS / MANFREDI** for the Natural History Museums of Los Angeles County

Prepared for the Natural History Museums of Los Angeles County

La Brea Tar Pits & Museum
5801 Wilshire Blvd
Los Angeles, CA 90036

By Weiss/Manfredi

WEISS / MANFREDI
Architecture/Landscape/Urbanism
200 Hudson St 10th Floor
New York, NY 10013

The possibilities that exist at La Brea Tar Pits have captured our collective imaginations for some time. As we look forward to the next generation of research and public service, the opportunity to reshape this very special place is both thrilling and timely. Building upon the Loops and Lenses competition entry, the La Brea Tar Pits Master Plan and Concept Design seeks to capture the immense potential of transformation with a comprehensive vision that extends the research and programmatic mission of La Brea Tar Pits through a cohesive campus in the heart of Los Angeles.

This master planning effort has benefitted tremendously from the dedicated support and active engagement of the NHMLAC Leadership and Master Planning Team, Board of Trustees, Board Steering Committee, NHMLAC Planning Working Groups, and our strong team of engineering and specialty consultants. In a new framework vision that weaves together a renovated and expanded museum with a rejuvenated park, Weiss/Manfredi is honored to share a Master Plan that will guide this remarkable and unique institution towards the future as a vibrant community asset and an internationally recognized scientific and cultural mecca.

Marion Weiss and Michael A. Manfredi

Loops and Lenses: Master Plan and Concept Design

Discovery and Inspiration 6
Connect the Museum and Park to the Cultural Landscape 15
Enhance Hancock Park's Environmental Identity 22
Magnify the Museum's Visibility 45
Reveal the Museum Collection 58
Capturing Imagination 73

Project Credits 75

Discovery and Inspiration

"Loops and lenses connect and reveal an open-ended journey of discovery and inspiration."

This story begins 20 million years ago. Organisms on the ocean floor were slowly compressed by marine sediments into crude oil. Then came the glacial retreat during the Ice Age, followed by thousands of years of tectonic shifts before oil finally seeped up to the earth's surface and turned into asphalt. It is within these sticky pools of tar that animals and plants are trapped, killed, and ultimately preserved. Over time, the site has become a rich repository of extinct and extant lifeforms on Earth, forming a record of our changing environment. Specimens excavated from the site teach us about the history of the planet and, more importantly, help us imagine our future on Earth in the current Anthropocene era.

Throughout our lives, La Brea Tar Pits has provided an enduring source of wonder and a point of orientation for our own exploration and understanding of the world. Few other parks in the world bring active discovery and raw curiosity into such tantalizingly close reach. Few other museums in the world juxtapose real-time excavation and imaginative display. With all the potential of a phenomenal landmark in place, the site can be further transformed into a cohesive destination that serves both the public and scientists. Already an internationally recognized institution and a key component to the region's cultural milieu, the transformed museum and site must have greater legibility, provide a richly layered visitor experience, and enhance the city with a dramatic new setting for science, education, and public life.

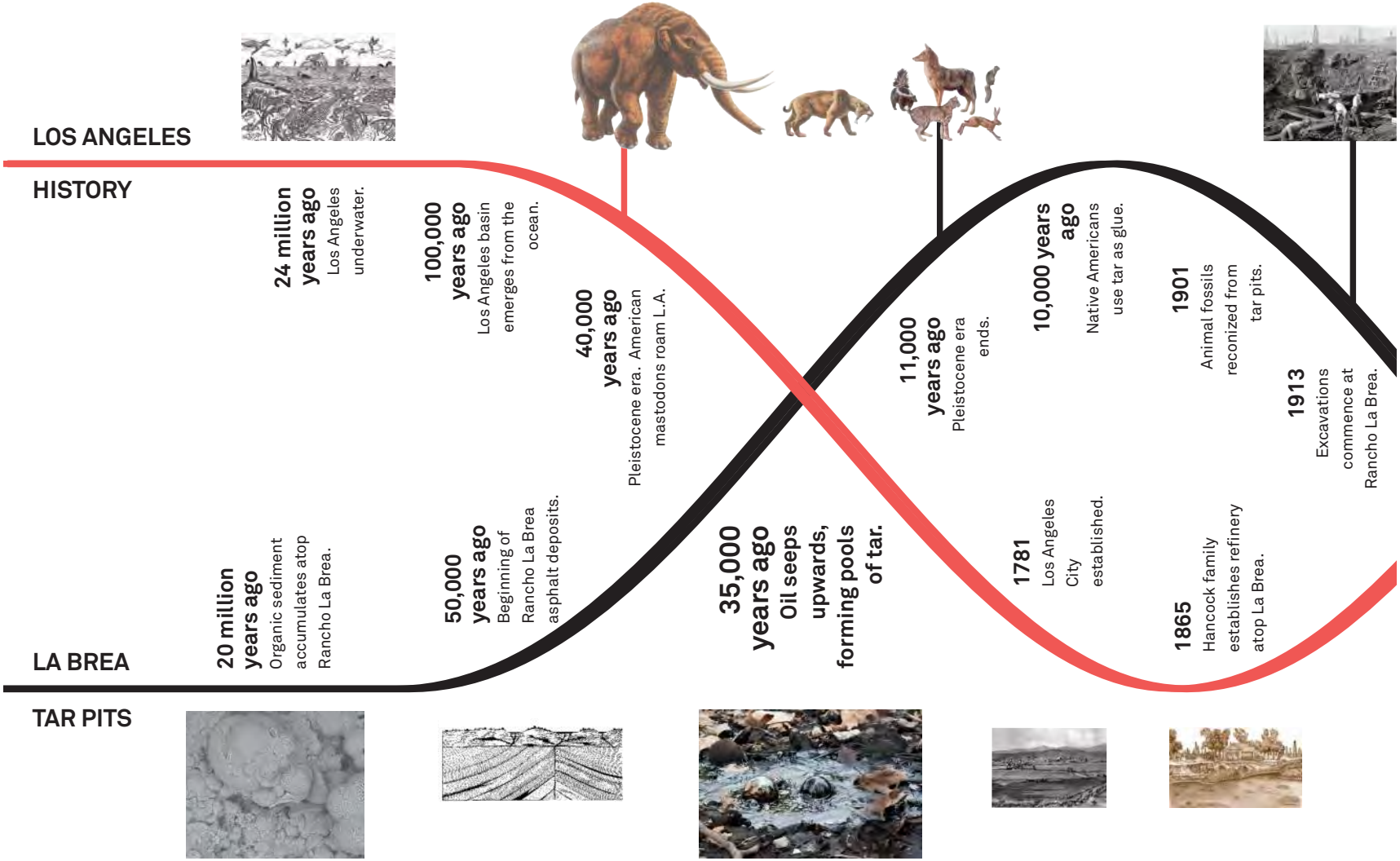
Building upon the Loops and Lenses competition entry, the La Brea Tar Pits Master Plan redefines Hancock Park and the museum as one unified identity. The continuous loops connect the rich but disparate existing structures, enhancing amenities for community and research. The lenses, as framed views throughout the park and museum, bring into focus the museum collection and scientific activities at multiple scales. As flexible armatures, loops and lenses connect and reveal—they form an intimate journey of discovery and inspiration. Together they tell the story of La Brea Tar Pits: the continuum from prehistoric time to our contemporary moment.

FOUR DESIGN PRINCIPLES:

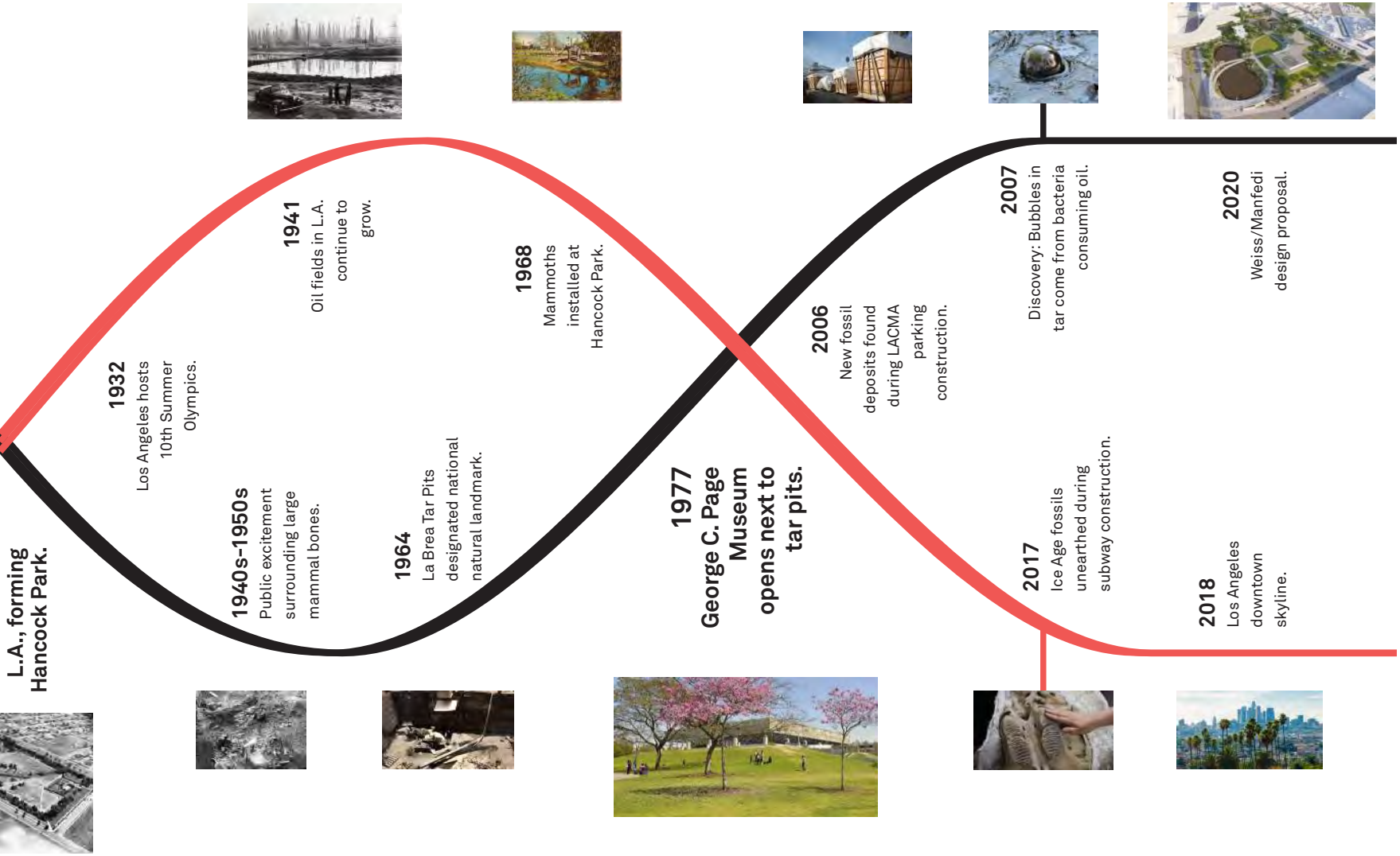
- Connect the Museum and Park to the Cultural Landscape
- Enhance Hancock Park's Environmental Identity
- Magnify the Museum's Visibility
- Reveal the Museum Collection

Connecting Histories
La Brea Tar Pits & L.A.

The paleontological history of the Tar Pits and the relatively short history of Los Angeles have been interconnected in continuous and paradoxical ways. Here, science is literally extracted from this ever-changing site. The La Brea Tar Pits has preserved the flora and fauna from the Pleistocene past in a city committed to inventing the future.



How can these histories connect in new revealing ways?

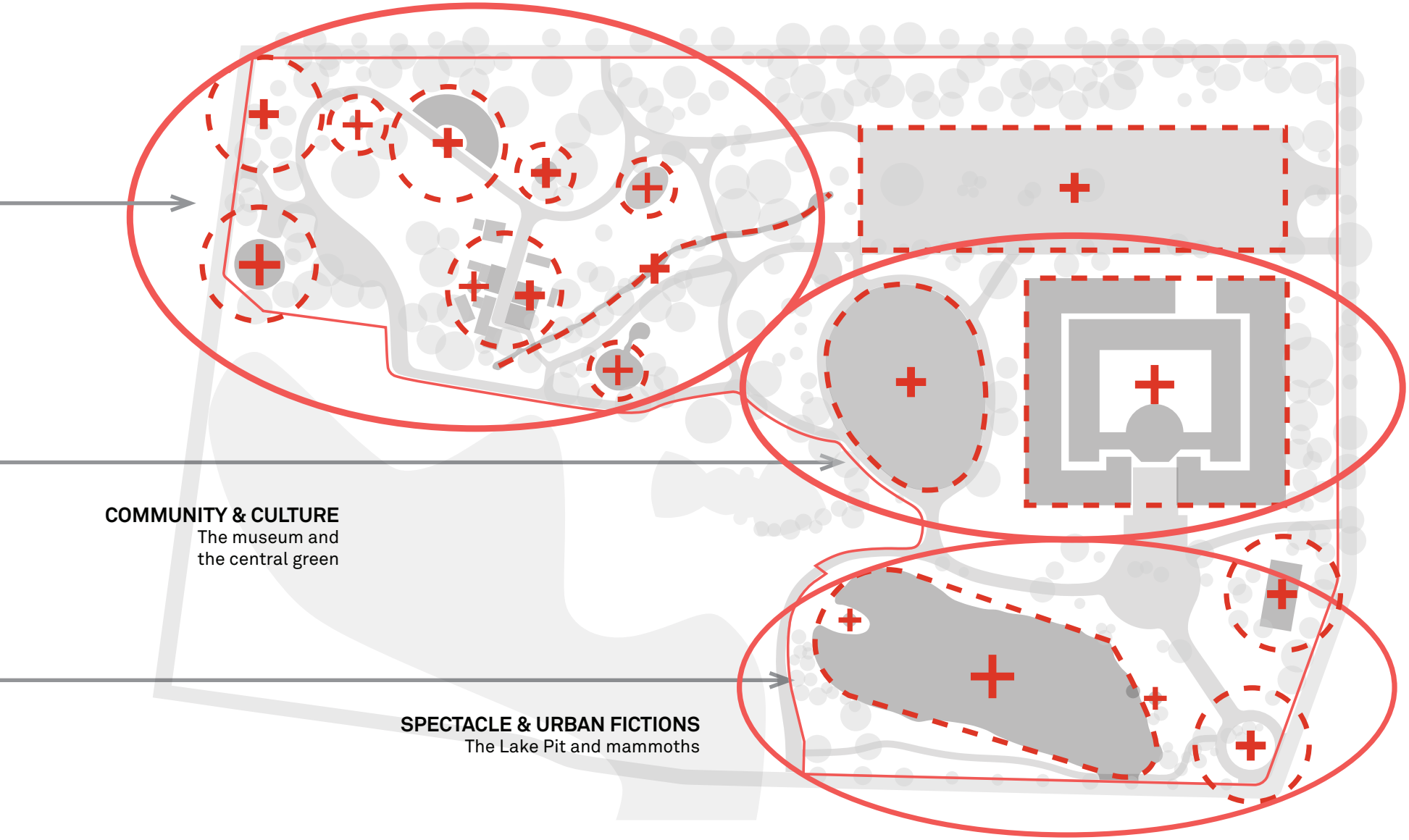


Amplify the Park Identities

The creation of Hancock Park was a gift to the community over 100 years ago. Over time, the park and the museum have evolved idiosyncratically. The existing collection of pathways wander through the park yet fail to create legible connections. However, a collection of latent identities exists on site. “Excavation and discovery” characterize the northwest precinct, “community gathering and the museum” give focus to the center, and “the lake pits and park amenities” are visible from Wilshire Blvd.

RESEARCH & REVELATION
The excavation pits and the Pleistocene Garden

How can we bring into focus and connect the latent identities of each park precinct?

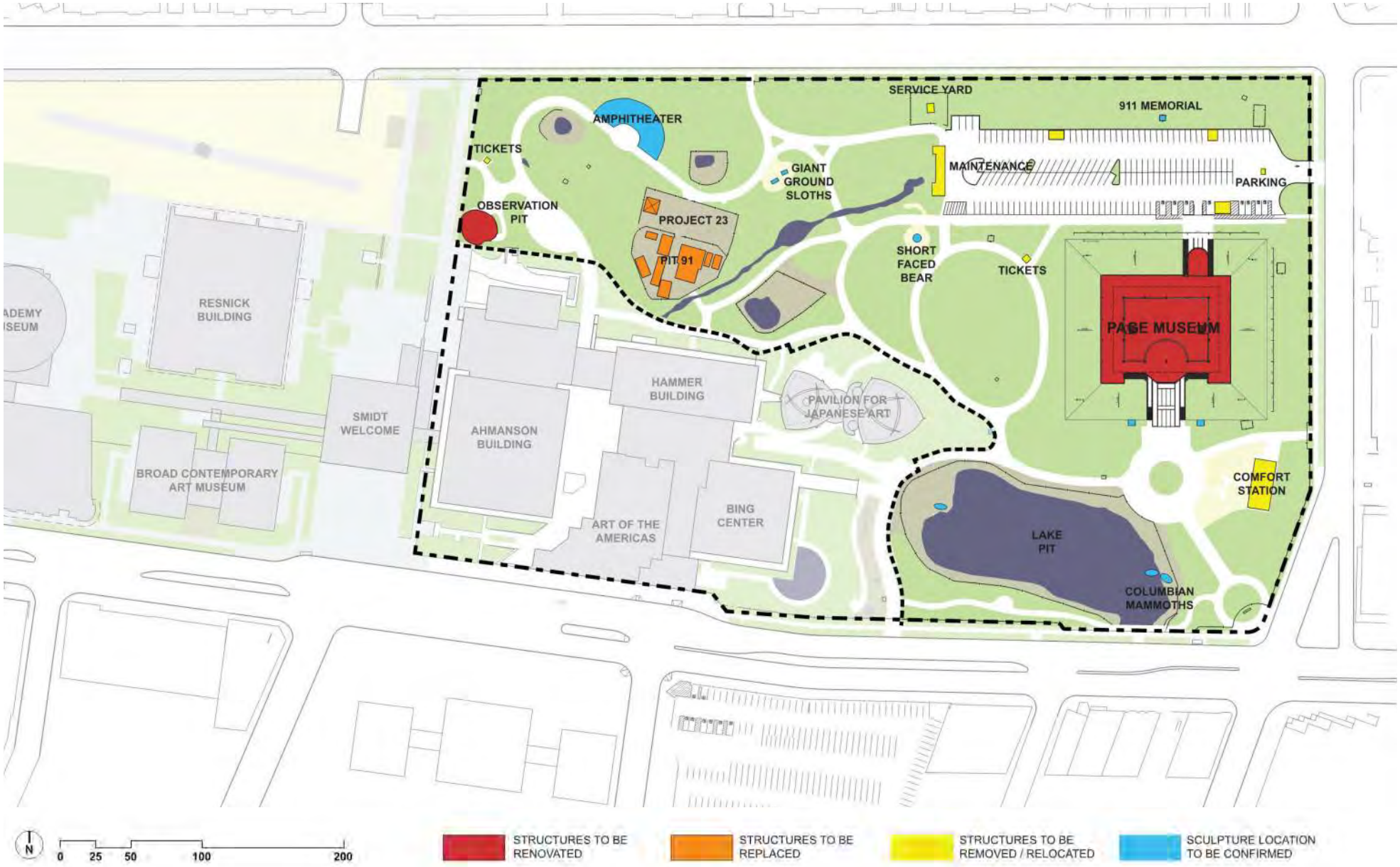


Existing Site
The Museum and Hancock Park

The scope extent of the Master Plan includes the existing museum and Hancock Park.

Site Analysis
Existing Site Structures

Through examination of existing documents and site visits, the structures that exist onsite have been identified.



Site Analysis
Existing Pits and Tar Seeps

Existing tar pits and their potential as future excavation sites have been studied with Research and Collections.

Connect the Museum and the Park to the Cultural Landscape

Loops and Lenses

Hancock Park is the only public greenspace within a 1.5-mile radius. An active excavation landscape unique among public parks, the park's tar seeps occur sporadically. Since 1926, a constellation of structures has been constructed to contain and display this phenomenon as a part of Los Angeles's history. They are distributed at various locations across the site, lacking a shared identity. Understanding the rich overlap between these elements is central to our approach, which seeks to connect and inspire.

The La Brea loops, a triple Möbius that links all the existing elements of the park, aims to redefine Hancock Park as a unified experience. This 1-kilometer pedestrian path unifies the rich yet disparate existing elements of the site: the Lake Pit, the tar pits, the lawn, pavilions, and the museum.

Within the loops are park areas with distinct themes: research and revelation, community and culture, spectacle and urban fiction. The different identities of the loops embody journeys, with programming that appeals to diverse interests—from paleontology to bird-watching, from art to kids' playgrounds. The science walk allows students and curious adults to observe excavation and research in action. Picnic and recreational areas are situated throughout the park. Various park destinations and seating areas along the loop provide more intimate spaces for reflection. At the loop's outward-most points, the path transforms into entry pavilions that provide orientation, legibility, and amenities. Greater visibility from Wilshire Boulevard and the surrounding context further binds La Brea to the community of Los Angeles.

Wilshire Gateway & Lake Pit

At the Wilshire Gateway, a new Entry Canopy defines a welcoming threshold between park and city and enables greater visibility from Wilshire Boulevard and the surrounding context. Under the canopy, a new welcome pavilion and shaded entry plaza provide orientation, spaces for gathering and queuing, and restrooms. Through conversations with the various NHMLAC Working Groups, an enhanced school drop-off was identified, enabling the choreography of student tour itineraries that are distinct from general museum visitors and other tour groups. A picnic area under the canopy and shade trees provides new programming opportunities, from outdoor education and school lunches to orientation and gathering.

The Wilshire Loop features a new garden bioswale that tells a story of sustainability and manages stormwater in an area separate but adjacent to the Lake Pit. Supported by the engineered bioswale site, new plantings form a Pleistocene Garden and create a new, more accurate setting for the relocated iconic mammoths and mastodon sculptures. The loop pathway provides cinematic views of this important new landscape while interpretive signage allows park visitors to imagine a Pleistocene environment, extending the narrative impact of this important gateway to the La Brea Tar Pits. A pedestrian bridge increases the legibility of the Lake Pit bringing park visitors above the lake and the methane bubbles that break its surface. New interpretive opportunities reveal the former industrial heritage of the site and explain the connection between Los Angeles of today and the natural resources that have powered its growth and development.

Research & Revelation

At the 6th Street Gateway, a shaded entrance and welcome pavilion provides orientation, legibility, and amenities. As a visible point of Connection to LACMA and a point of arrival from the residential communities to the north, this new entry will welcome visitors to a shaded park space where community park and recreational needs are balanced with the research activities of La Brea. Under the canopy of shade trees, visitors will find diverse destinations including play areas, picnic areas, seating and interpretation zones at the protected tar seeps, the gentle topography and bioswales along Oil Creek, and the revitalized destinations of the Dorothy Brown Amphitheater, the Observation Pit, and Pit 91. Along the south edge of the loop path, connections will allow access to the LACMA plaza and links to other Hancock park programs and transportation connections.

As the precinct most rich with fossils and active tar seeps, the planning approach to the westernmost Research Precinct involved extensive conversations with Research and Collections. As National Natural Landmarks it is important to preserve the active tar seeps which continue to trap leaves, insects, pollen, and other materials to log an ongoing record of La Brea. As fossil-rich zones, the pits must be protected to allow future excavation and research. As dynamic dig sites, they must continue to be safe and functional facilities that demonstrate the impact of ongoing research to diverse park visitors. Finally, as historic settings, Pit 91 and the Observation Pit must continue to reveal the legacy of the site while adapting to new uses and engaging park programming.

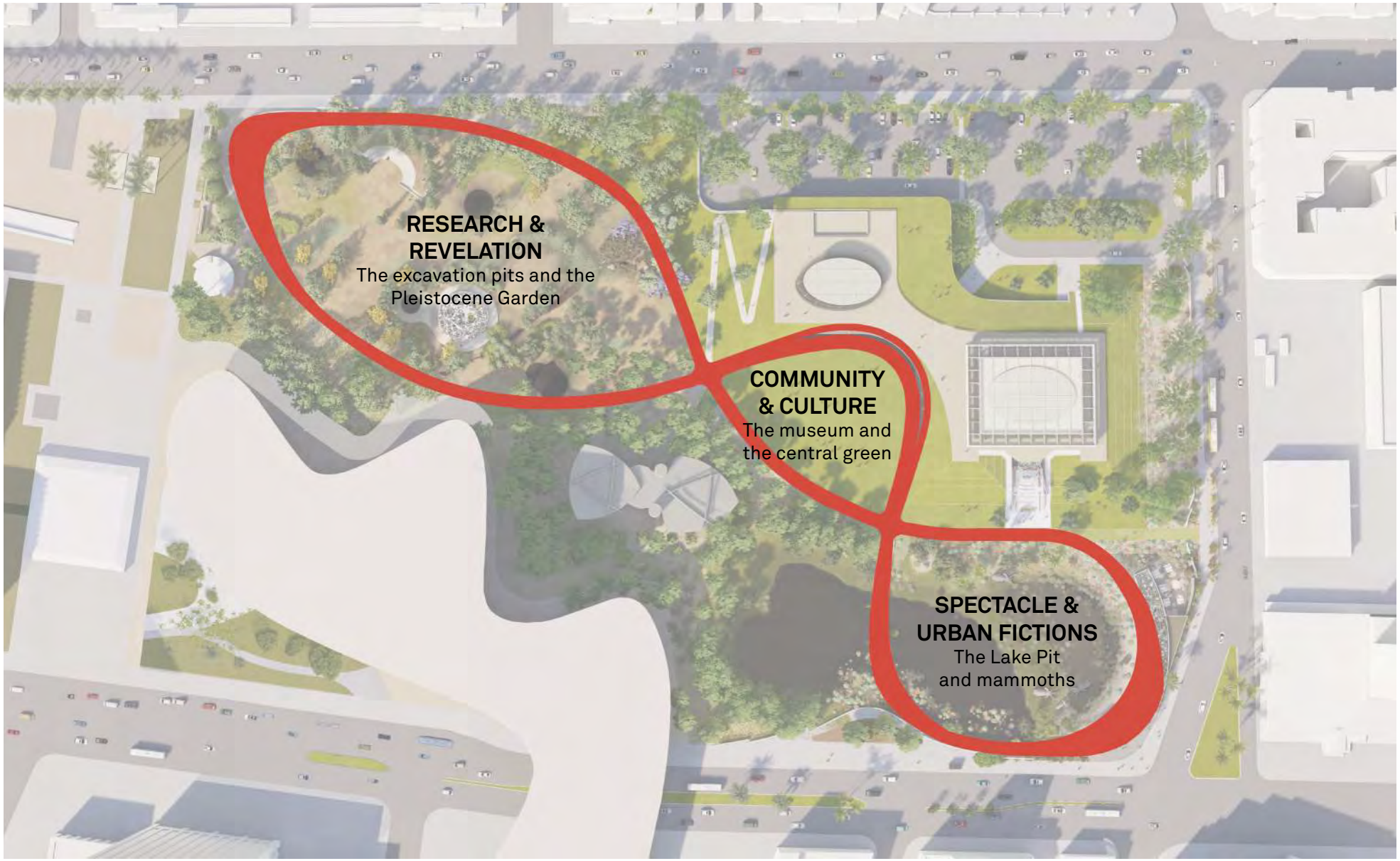
Much of the existing research facility will change, with the activities of excavation and research reorganized to realize opportunities to enhance the public park experience and more effectively supporting the excavation and research process. A key factor in this reorganization involves relocating the storage and excavation of Project 23 materials to space within and adjacent to the expanded museum, while Pit 91 continues to be a key research and interpretation destination in the park.

Central Green

As a site for community and culture, the Central Green provides a destination community lawn that amplifies the rich activities and events that take place in Hancock Park. At the heart of Hancock Park, the Central Green is a point of connection between the other two loops of La Brea Tar Pits, the museum, LACMA, and the Japanese Pavilion. The Central Green is active throughout the day. Early in the morning, as the park opens, the Central Green is a setting for community activities and health and wellness programs. As the day progresses, the lawn comes alive with visiting school children, museum tour groups, and community members. Provisions for improved infrastructure and a drivable path allow increased event opportunities in the park and additional dining opportunities on summer weekends and holidays when the museum visitation increases. In the evening, the green is transformed for events and outdoor film, with the illuminated museum framing a place of connection and wonder.

Site Strategy
Loops & Lenses

The La Brea Loops, a 1-kilometer triple Möbius path, link all existing elements of the park and provide a connected identity.

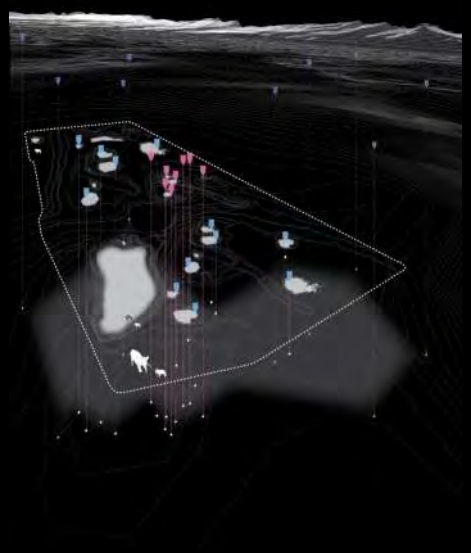


Site Plan

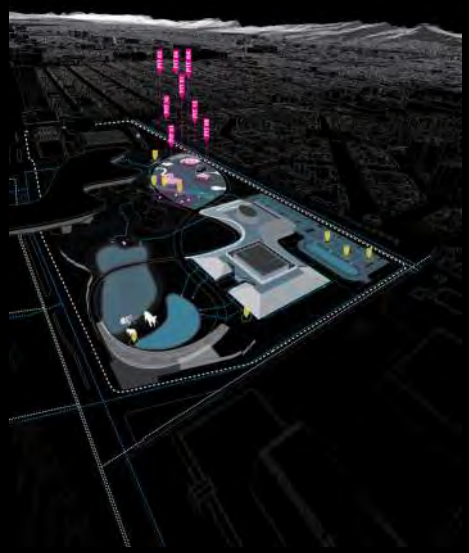
A unified park will express the vitality and critical relevance of La Brea Tar Pits' mission and create a dynamic, actively programmed site.

A Dynamic Site

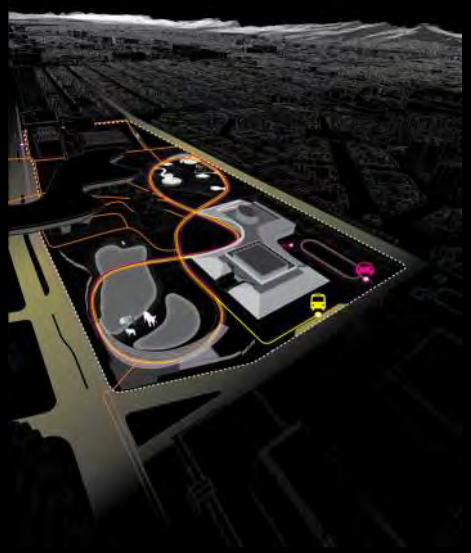
A richly layered site, the reimagined park and museum will create a dynamic setting for science, education, ecology, and public engagement.



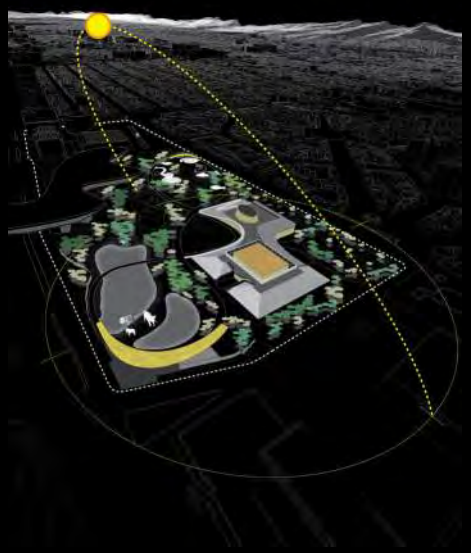
Pre-History
Upswelling forces formed the tar seeps of the Pleistocene



Fluvial Formations
Site morphology formed by water & the dynamics of methane and asphaltic tar



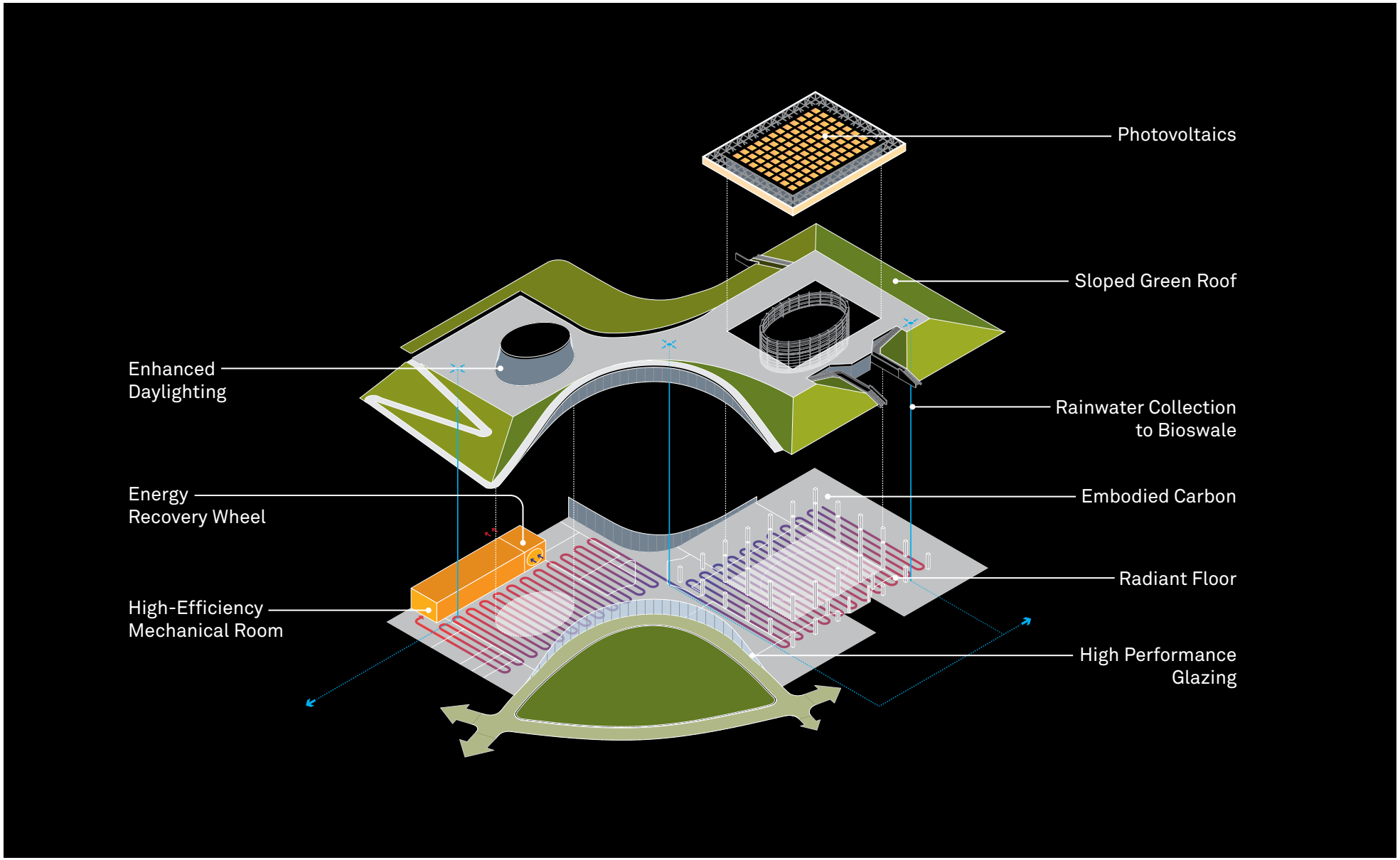
Inhabiting Topography
A public landscape choreographs the diverse communities and activities of L.A.



Sustainable Canopies
New shade structures, solar voltaics, and trees balance the needs for sun and shade

Sustainability Goals

The renovated and enhanced museum will recognize the ambitious goals outlined in L.A. County's "Our County Plan."



Enhance Hancock Park's Environmental Identity

The park areas encircled by the loops are given three distinguishing themes: research and revelation, community and culture, and spectacle and urban fiction. Each with its distinct identity, they serve diverse interests and usage. They are designed to maximize space for community, creating opportunities for the public to engage with the site's natural history.

Within the research loop, reframed and protected pit sites and a new outdoor classroom allow people to better witness active excavation and engage in programs and education under a canopy. The existing lawn is expanded for public recreation, with additional picnic areas around the loop. Various play areas throughout the park provide a space for children to learn about the site's geology through play and tactile experience.

Within the loops are distinct landscape zones, representing different geologic epochs of the site's history and aiming to refine the identity of the park to better tell La Brea's story. The approach to landscape takes advantage of the park's topography and opportunities to manage stormwater and envision a programmatically rich ecosystem that reflects the botanical diversity La Brea has witnessed across several epochs. Extending the story of the botanical fossil record of the museum, the park provides an opportunity to understand plant communities of the past, the impacts of climate change, and the urgency for learning to adapt to the climate of the future. The new park landscape extends from Wilshire Boulevard through the site, forging connections between city and museum, and past, present, and future.

PUBLIC AMENITIES

- Amenity pavilions
- Central lawn
- Café
- Rooftop Terrace
- Expanded Lake Pit
- Bioswales
- Outdoor classrooms
- Picnic areas
- Public art
- Play areas
- Rolling hills
- Observation Pit

Hancock Park Planting Concept
The planting concept for Hancock Park is comprised of three distinct zones encircled by the looping path system. Each loop has its own usage and distinguishing theme—Pleistocene, Holocene, and Anthropocene—representing different geologic epochs in the site's history. A woodland zone along the park's peripheral edges (northern, southern, eastern, and western) provides shade to the picnic areas and the parking lot to the north. These landscape zones are designed to maximize space for community, creating opportunities for the public to engage with the site's natural history and create a distinctive identity for the park to help tell La Brea's story. The planting scheme addresses the realities of Los Angeles's current and projected climate and aims to ease water consumption, ensure appropriate maintenance, promote sustainable growth, and provide a model for resilient site planning in the area.

The Southeastern Loop
The southeastern loop near the corner of Wilshire Boulevard and Curson Avenue encompasses the area surrounding the Lake Pit. The Columbian Mammoth sculptures located in the Lake Pit are an iconic element of Hancock Park and a key part of the story, however the current installation lacks historical accuracy. The concept plan envisions this loop as a Pleistocene environment reminiscent of the climate these animals inhabited. This zone will incorporate a biofiltration area to help manage stormwater and will be planted with low ground cover plant types that would have attracted large herbivores. The proposed ephemeral wetland is a more accurate portrayal of the Pleistocene environment that existed around the tar seeps when the mammoths like those represented would have been trapped. High biodiversity and era-accurate planting will serve an educational narrative in this highly visible entry to the park.

The Western Loop
The western Loop is envisioned as a Holocene landscape consisting of plantings from a warmer era after the ice age. This zone contains historic excavation pits and active research zones, allowing visitors to witness ongoing excavations. Areas of climate-appropriate native plantings ease water consumption, ensure appropriate maintenance, and promote sustainable growth. A forested woodland consisting of Torrey Pine and Coast Live Oak provides shade to the tar pits landscape. These trees have the character and scale to achieve a high-impact landscape to

enhance the identity and experience surrounding the excavations, seeps, and recreational areas. The western loop also contains Oil Creek which will be developed into a biofiltration zone for stormwater management and can support Sequoia and Monterey Pine trees in wetter pockets.

The Central Loop

The central loop is an Anthropocene landscape, engineered to support community engagement. Here a large common lawn adjacent to the museum provides a setting for recreation, events, and public gathering. The lawn and sloped green roof of the museum requires a higher degree of irrigation than the zones at the southeast and west.

Peripheral Edges of the Park

A woodland forest occupies the park's edges to provide shade to the picnic area on Curson Avenue and the parking lot north of the museum, and to provide a visual buffer from the LACMA expansion to the west and south. The palette of Torrey Pine and Coastal Live Oak are extended and support the development of a unified canopy across the site. A biofiltration area is located within the vehicular drop-off loop to manage stormwater flows from the parking lot.

Existing Conditions and Enhancements

Existing trees and plantings throughout the park are scattered and achieve little sense of character or unity. The enhanced character of the park will require new plantings as well as existing trees and plantings that complement the concept design. Species such as the Western Sycamore, California Buckeye, and Redwood should be preserved. Mexican fan palms, agaves, and yuccas will be reduced. The museum expansion and parking lot will require the removal of existing trees on the northern side of the site. Due to the cost and difficulty, it is not recommended to move the existing trees. Replanting the site with new trees is likely to be less costly and new smaller specimen trees will provide value and survive better over time. Current soils on site appear to be suitable for the proposed planting palette and a large renovation of soils is not anticipated, however this will require further evaluation as the project proceeds.

Wilshire Gateway & Lake Pit

A new Pleistocene garden bioswale and entry canopy increases the legibility of the Lake Pit and enables greater visibility from Wilshire Blvd and the surrounding context.

Bridge Across Lake Pit

A pedestrian path brings people above the Lake Pit, a dynamic site for urban fiction and imagination.

Arrival Experience

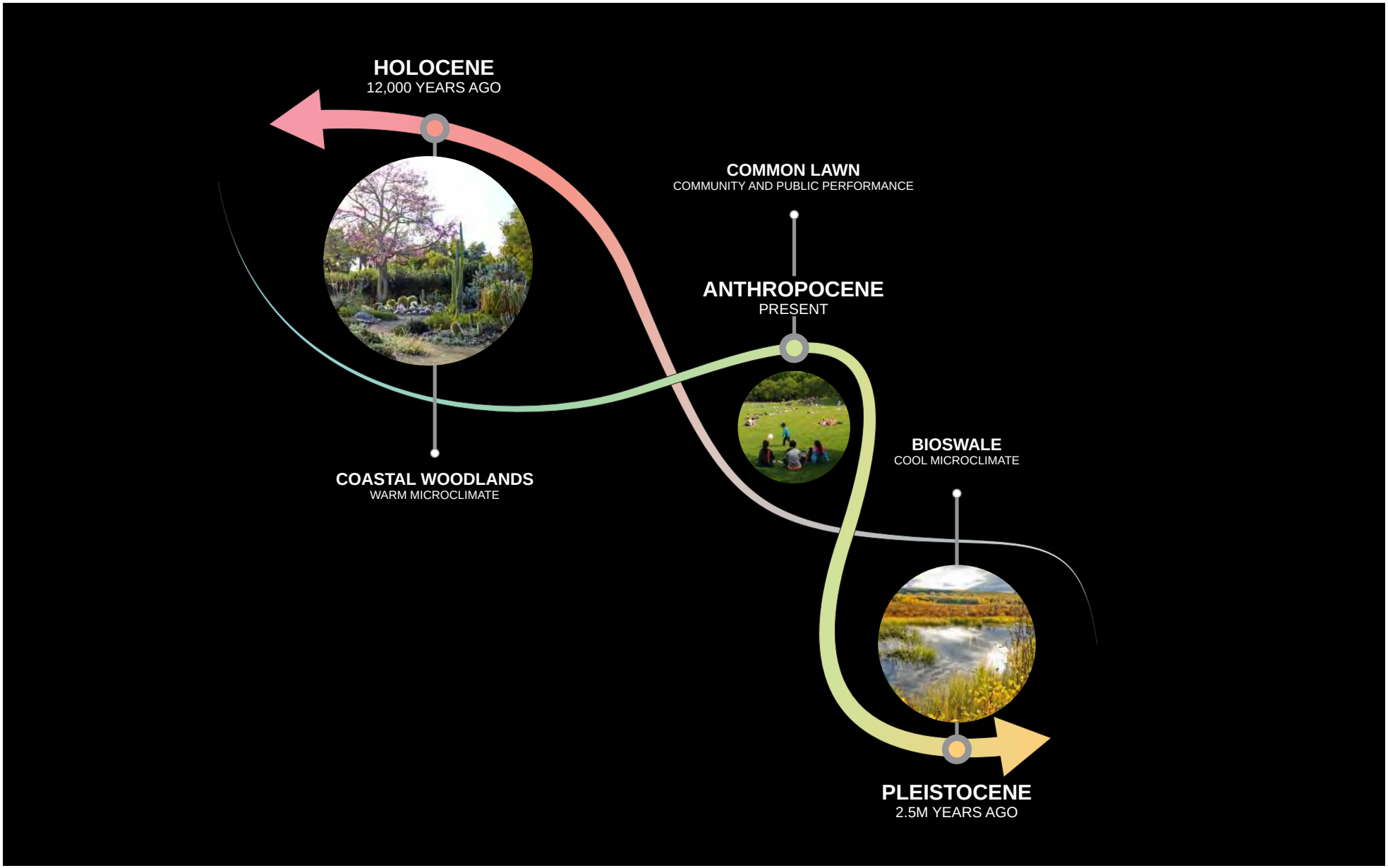
The entry canopy at Wilshire Blvd is the gateway between city and park, providing orientation, legibility, and shade.

Entry Plaza

A new shaded entry plaza at Wilshire Blvd provides framed views with a Pleistocene garden bioswale, sculptures, and interpretive signage.

Landscape Zones
Geologic Epochs

The planting concept for Hancock Park is comprised of three distinct zones, each with its own distinguishing theme representing different geologic epochs.

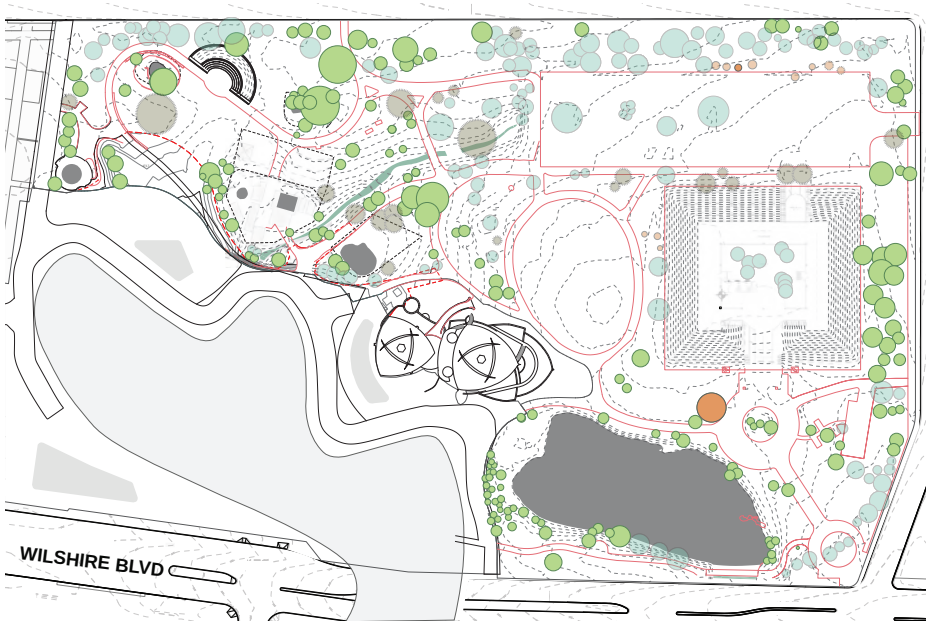


Sustainable Site Strategies

Understanding L.A.'s current and projected climate, the planting strategy aims to ease water consumption, ensure appropriate maintenance, and promote sustainable growth.

Existing, New & Relocated Trees

The planting scheme seeks opportunities to preserve existing trees and to strategically plant new ones.



Existing Trees

- TO REMAIN
- TO BE REMOVED/RELOCATED
- DISEASED TO BE REMOVED
- MEMORIAL TREES TO REMAIN
- MEMORIAL TREES TO BE RELOCATED/REMOVED

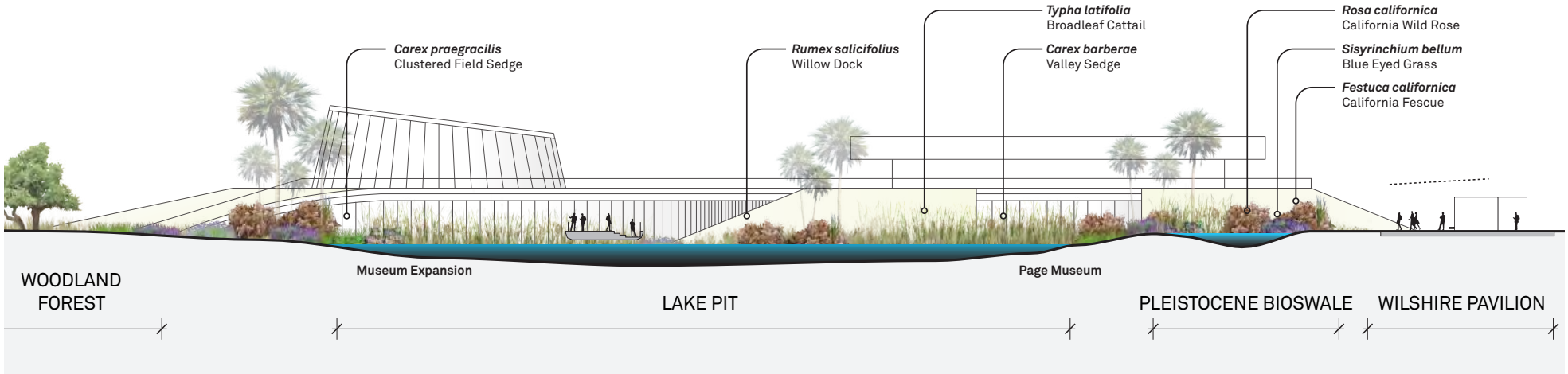
Potential New Trees

*Plans are conceptual and subject to change

- TO REMAIN
- NEW OR RELOCATED TREES

Lake Pit Entry Garden & Pleistocene Bioswale

A new Pleistocene garden bioswale supports sustainable stormwater management and makes the museum's mission visible in the park.



Herbaceous Species:

Anemopsis californica
Yerba Mansa

Hemizonia fasciculata
Clustered Tarweed

Sisyrinchium bellum
Blue Eyed Grass

Claytonia perfoliata
Miner's Lettuce

Cyperus eragrostis
Tall Cuperus

Typha latifolia
Broadleaf Cattail

Rumex salicifoliu
Willow Dock

Festuca californica
California Fescue

Carex barberae
Valley Sedge

Carex praegracilis
Clustered Field Sedge

Woody Species:

Baccharis salicifolius
Seep Willow

Salix exigua
Narrowleaf Willow

Salix goodingii
Goodding's Willow

Rosa californica
California Wild Rose

Sambucus caerulea
Blue Elderberry

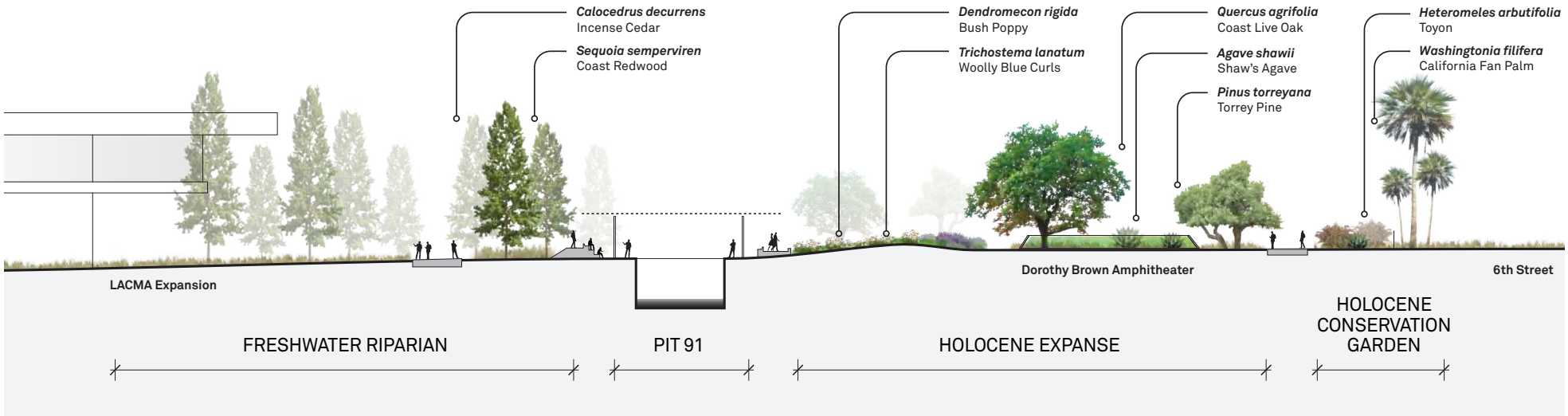
Pluchea sericea
Arrowweed

Salix lasiolepis
Arroyo Willow

Cornus stolonifera
Creek Dogwood

Late Pleistocene-Holocene Expanse

Climate-appropriate native plantings enhance the identity and experience around the tar seeps and throughout the surrounding park.



Trees:

Quercus agrifolia
Coast Live Oak

Pinus torreyana
Torrey Pine

Washingtonia filifera
California Fan Palm

Shrubs:

Arctostaphylos glandulosa
Eastwood Manzanita

Bigberry Manzanita
Arctostaphylos glauca

Artemisia californica
California Sagebrush

Baccharis pilularis
Coyote Brush

Comarostaphylis diversifollia
Summer Holly

Dendromecon rigida
Bush Poppy

Eriogonum arborescens
Santa Cruz Island Buckwheat

Heteromeles arbutifolia
Toyon

Salvia apiana
White Sage

Frangula californica
California Coffeeberry

Prunus ilicifolia
Hollyleaf Cherry

Salvia mellifera
Black Sage

Trichostema lanatum
Woolly Blue Curls

Perennials:

Agave shawii
Shaw's Agave

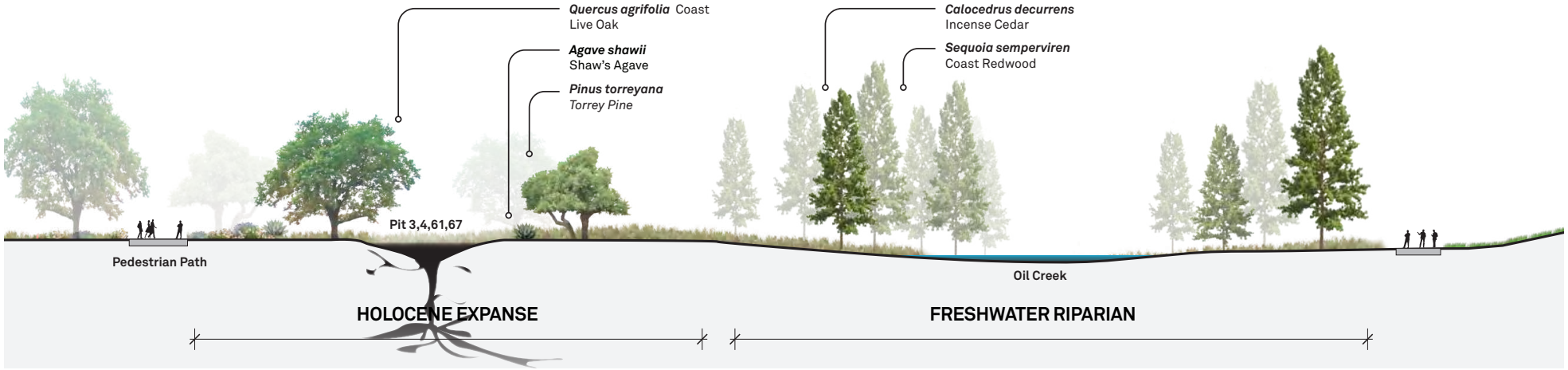
Hesperoyucca whipplei
Our Lord's Candle

Penstemon spectabilis
Showy Penstemon

Mimulus aurantiacus
Bush Monkeyflower

Freshwater Riparian

A forested woodland provides shade around the tar pits, and a new biofiltration zone at Oil Creek manages stormwater, supporting pine trees in wetter pockets.



Trees:

Acer negundo
California Box Elder

Platanus racemose
Western Sycamore

Calocedrus decurrens
Incense Cedar

Pinus radiata
Monterey Pine

Sequoia semperviren
Coast Redwood

Shrubs:

Sambucus caerulea
Blue Elderberry

Salix gooddingii
Goodding's Willow

Salix laevigata
Red Willow

Research & Revelation

The research precinct preserves existing trees and creates new landscape settings for research, learning, and community recreation.

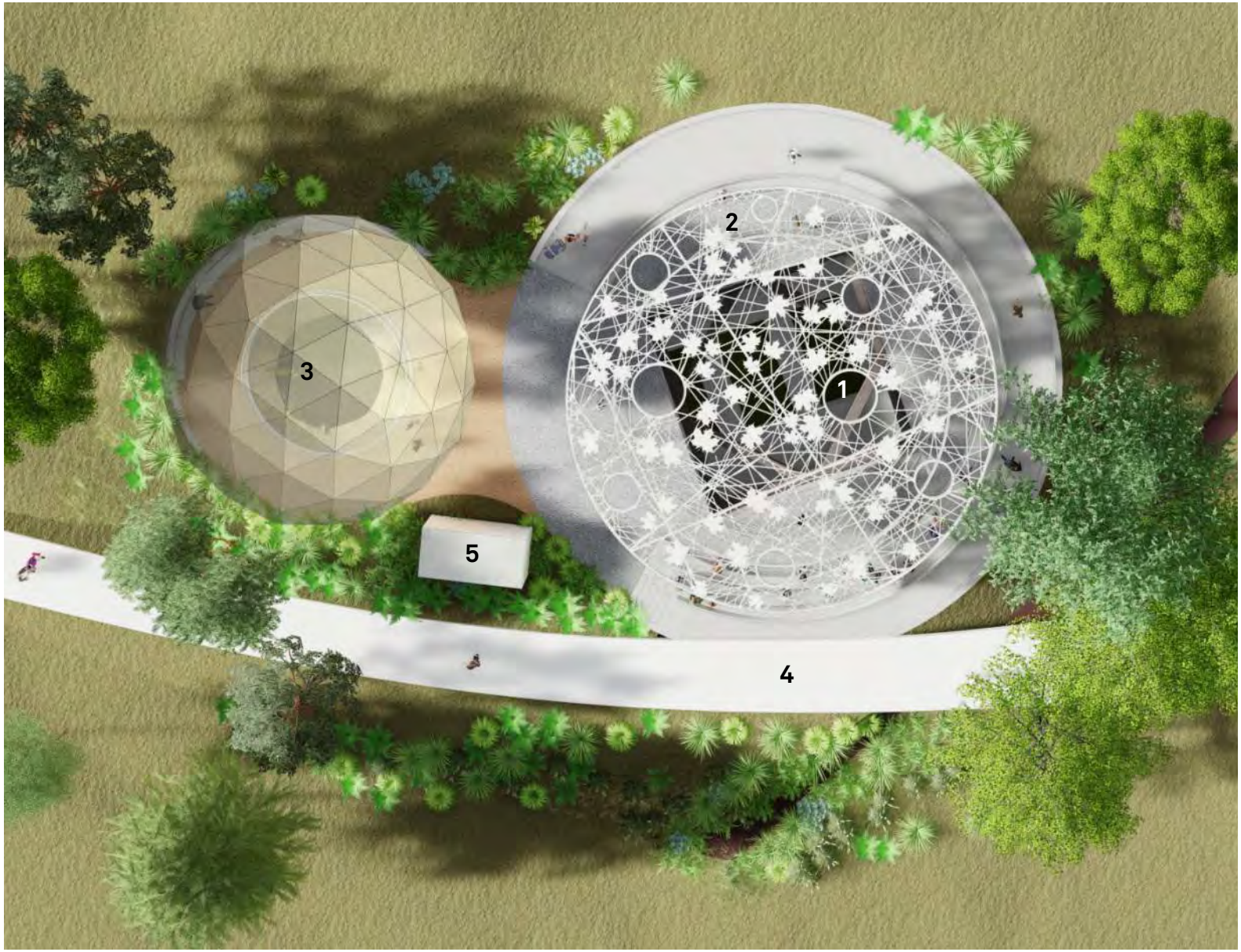
1. 6th Street Entrance
2. Pit 13
3. Pit 9
4. Observation Pit
5. Pit 10
6. Pit 91 Outdoor Classroom
7. Pit 3, 4, 61, 67

6th St Gateway

The entry canopy at 6th St provides orientation, legibility, and shade, while integrating existing trees into the canopy.

Research & Revelation

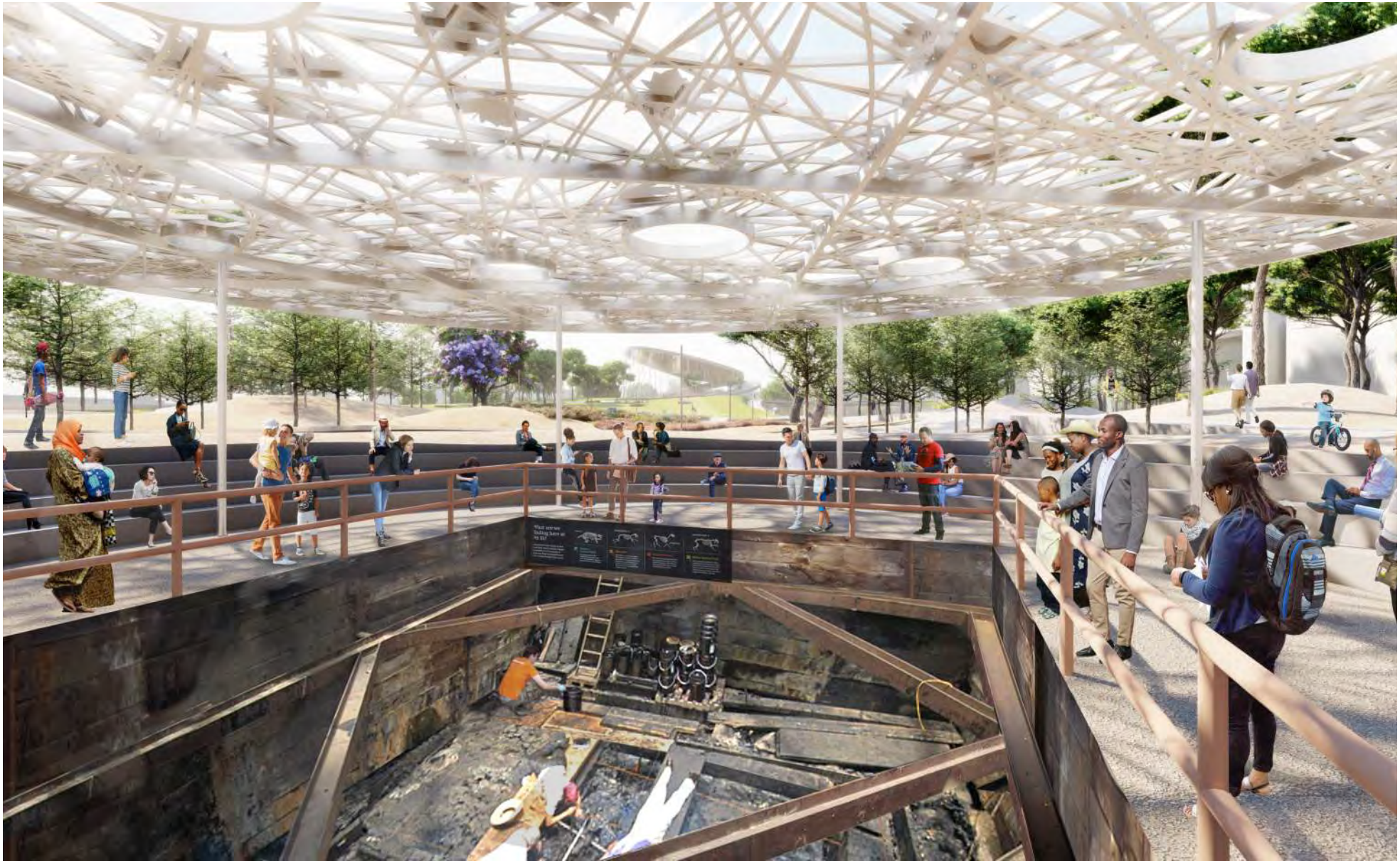
A new shaded classroom at Pit 91 engages park visitors in the process of excavation and sets the stage for future excavation and education opportunities.



1. Pit 91
2. Shaded Outdoor Classroom
3. Potential Future Field Work Area at Pit 10
4. Loop Path
5. Field Storage

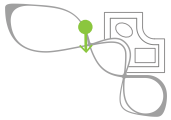
Pit 91

The active excavation sites unique to La Brea place park visitors at the precipice of scientific discoveries.



Play Area

Pit stops for play populate the loop.



Science Walk

Along the loops, the pits reveal scientific discovery to involve and engage the community.

Central Green

A new Central Green enhances Hancock Park's identity as a setting for community engagement.

Digital Mediums

Light projections express the museum's mission and create a place of wonder.

Activating the Site at Night

A digital diorama brings the Pleistocene to life.

Magnify the Museum's Visibility

The design approach to the museum expansion is rooted in close analysis of the existing building, preserving and magnifying its unique strengths. The museum pioneered the idea of exposing active research to the visitor. To further this spirit, our proposal aims to reveal the wealth of the collection and research to the public.

The expansion nearly doubles the current museum's size, sharing the same main and terrace levels as the existing building. A new museum lobby is situated between the two wings, welcoming visitors from the central lawn and from the drop-off and parking area at the northeast corner. Exhibit halls in both wings allow increased visibility of the active research taking place in labs and allow for views into collections storage. Theaters and classrooms adjacent to exhibits further enhance education and interpretation opportunities, extending the impact of a site rich in programs and activities.

The existing terrace on the museum's roof provides vistas of the park's tree canopy. The proposed design expands this terrace twofold, creating an expanded and accessible platform for public engagement and events. Here, the iconic fiberglass frieze of the museum finds its crystalline counterpart in the expansion, revealing La Brea's artifacts through the lens of its glass facade. Park visitors peek into the museum exhibitions, labs, and collections from various locations. Like a magnifying glass, the goal of the exhibitions is to bring artifacts into focus and amplify the telling of La Brea.

Building & Program
The preliminary building program and concept design balances program, use, adjacencies, site constraints, and budget considerations.

Lobby, Retail, and Food Service
The Master Plan includes greatly expanded facilities to support the visitor experience of La Brea Tar Pits. Additional spaces and a better choreographed experience will inspire more people to visit La Brea – and while there, participate in more activities and enjoy a more impactful experience. A central lobby is connected to a drop-off area and the central green. Retail and café off the lobby create a zone of amenities that are available to the public. Considerations for projected visitation and use informed the sizing of café and spaces for catering increase opportunities for events at the museum. Flexible theaters, gallery spaces, and indoor and outdoor gathering spaces have the potential to greatly increase the opportunities to host events at La Brea. The rooftop bar creates a local destination and accessible gathering space on the expanded public plateau.

Exhibitions
A thorough study of existing exhibits and exhibition spaces at the museum led to the incorporation of two new exhibition halls featuring visible connections to labs and collections. Benefiting from input by Museum Content, potential exhibit installations will better tell the story of the Pleistocene, explain the impact of La Brea research, and reveal the depth and significance of the collection. While a comprehensive exhibit design is to be developed in future phases of design, the planned new exhibition halls provide a flexible set of exhibit spaces of different scales and proportions that can accommodate a host of new exhibit and narrative opportunities.

Research & Collections
The Master Plan includes an increase of specialized lab spaces to better support the various processes of research at La Brea Tar Pits. Adjacency of exhibits to labs and collections reveal the staggering scale of the collection and the pipeline of research to museum visitors. Key lab spaces include a new solvent lab and jacket workroom to replace temporary facilities currently located in the park near Pit 91, as well as a new preparation lab, microfossil/community lab, imaging lab, visiting research spaces, and collections storage.

Classrooms & Theaters
The Master Plan include dedicated classrooms, the largest of which can be flexibly used as a multi-purpose space when not used for education functions. A microfossil/community lab provides an interactive classroom/lab setting for school and museum tours. A separate education entrance and lobby connects the education space of the museum to a park itinerary with additional outdoor spaces for learning. Improved theater spaces will increase opportunities for film, performances, lectures, symposia, and events at the museum. Leveraging adjacencies and connections to exhibits, lobby, central lawn, and expanded plateau, the spaces enable the museum to host programs and events of varying types and scales.

Offices, Facilities, & Maintenance
A preliminary staffing projection was developed to test opportunities for enhanced office and staff spaces. The Building Working Group provided extensive feedback on existing operations as well as how operations might be improved in the reimagined museum.

A Flexible Framework
As the program was tested and concept options developed, the Master Plan identified opportunities, clarified priorities, revealed the relative value of program elements, and established a framework for reinvisioning the museum. As the La Brea Tar Pits project progresses and additional program clarifications arise, the Master Plan and Concept Design provides a flexible framework, with opportunities to refine, increase, or scale back program elements as priorities evolve.

Main Level Plan

A central lobby connects the rejuvenated museum and new expansion.

1. Lobby
2. Expansion Exhibit Hall
3. Research Gallery
4. Research Labs
5. Collections Storage
6. Collections Support
7. Offices
8. Café
9. Gift Shop
10. Theater
11. Field Station Labs
12. Back of House
13. Satellite Facility

Northeast Drop-off

The northeast corner becomes a new drop-off to a lobby connected to the park.

Plateau Level Plan

The expanded plateau creates a setting for community engagement, events, and rooftop bar.

1. Expanded Plateau
2. Rooftop Bar
3. Classrooms & Exhibits Below
4. Exhibits Below
5. Green Roof
6. Accessible Ramp
7. Parking
8. Central Green

Expanded Plateau

The museum terrace extends to create an accessible and expansive public destination.

Reveal the Museum Collection

At La Brea, the impact of scale and the reality of the extraordinary can, in one instant of a school field trip, forge a lifelong point of reference for understanding our place in the universe. The museum currently has an invaluable collection of over 3.5 million specimens collected onsite, but only a fraction are currently displayed. The renovated and expanded museum will unpack and reveal more of this immense collection to the public.

At the center of the rejuvenated museum, a new research gallery houses a visible collections exhibit, inspired by the museum's iconic Dire Wolf Wall, that speaks to the immensity of the La Brea collection. Visible labs enable a thematic connection between exhibit material and the processes of excavation, conservation, curation, and research. Views into collections storage reveal a staggering quantity of fossils and artifacts, enabling visitors to comprehend the breadth of the collection as well as the pipeline of research.

With increased volume through a sunken exhibition pit and crystalline lantern, the new expansion exhibition hall allows for a host of new exhibit and education opportunities at multiple scales. Views into field station labs and to the park serve as a reminder of the distinctiveness of La Brea—and of a museum whose mission is profoundly interwoven into the unique history of its one-of-kind site.

Exhibits Connected to the Park

Visually connected to the park, the new Expansion Exhibition Hall enables a variety of scales of new exhibit and education opportunities.

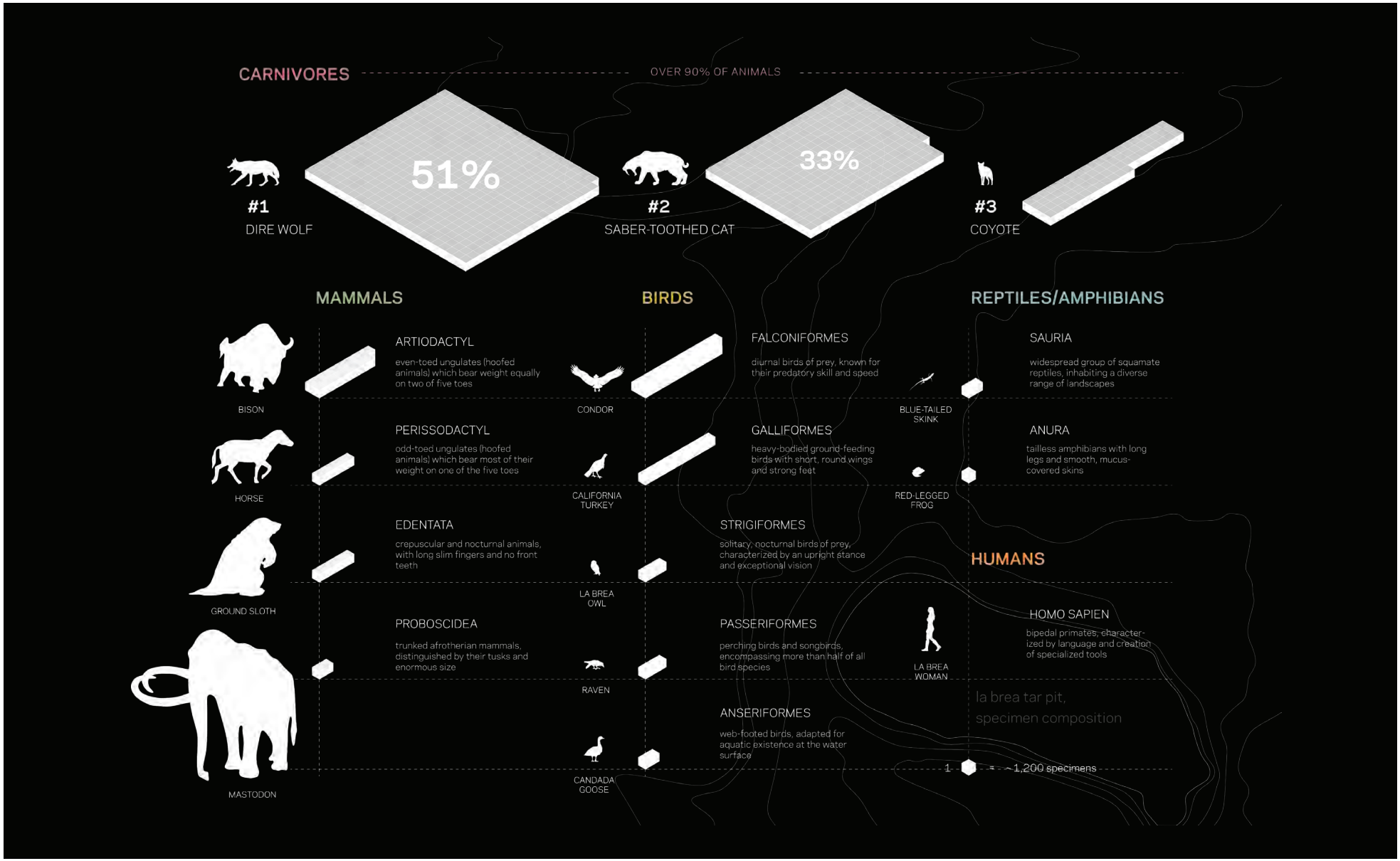
Exhibition & Research

In the Expansion Exhibit Hall, views into Field Station Labs reveal excavation and the process of research.

Excavation close-up: unpacking of Project 23 viewed from exhibitions

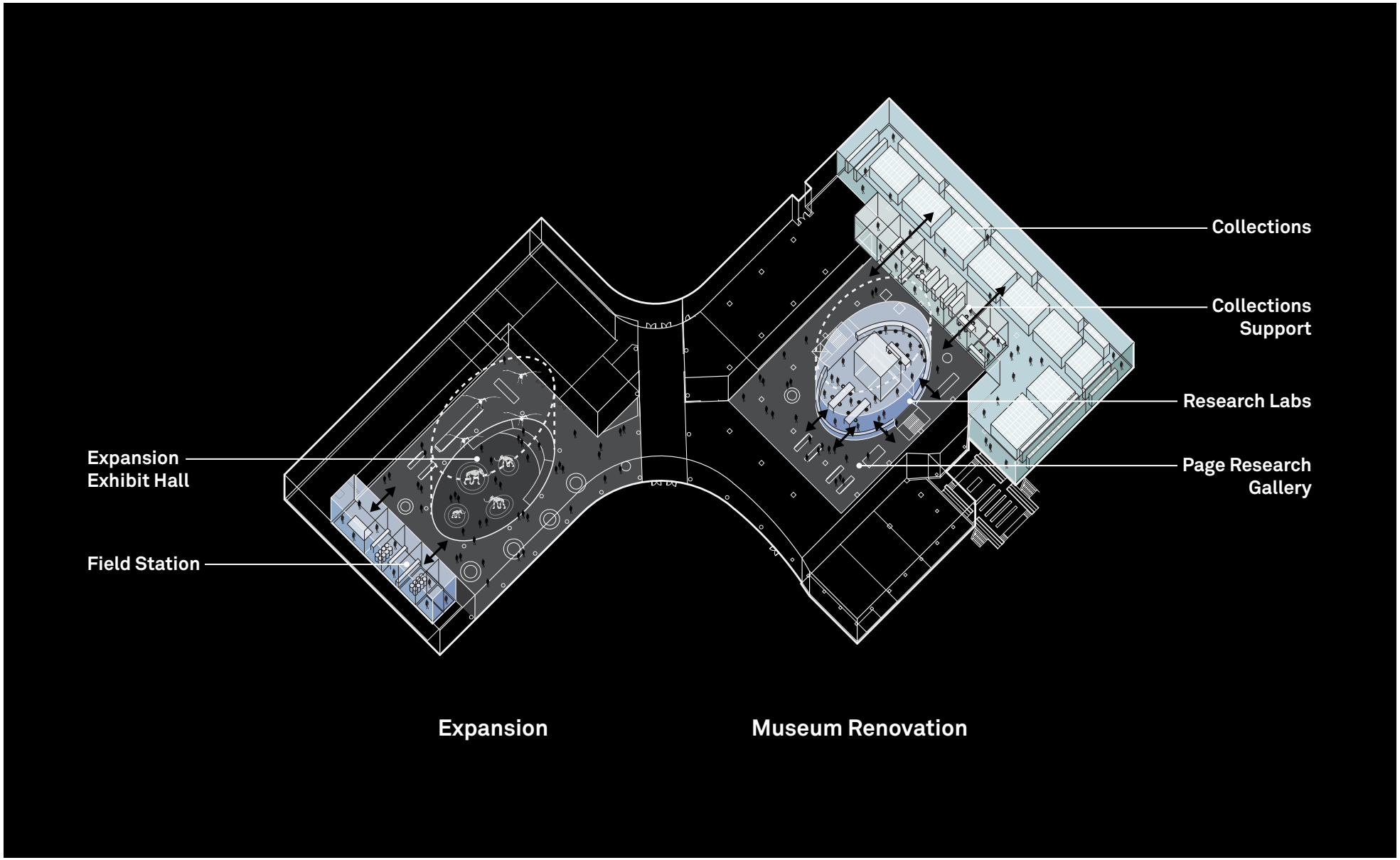
Collection Breakdown

An analysis of the La Brea collection's unique composition tells a larger story about the Pleistocene environment.



Exhibitions & Research

Exhibitions in the renovated museum and expansion are connected to research and collections and provide a range of narrative opportunities.



Exhibitions

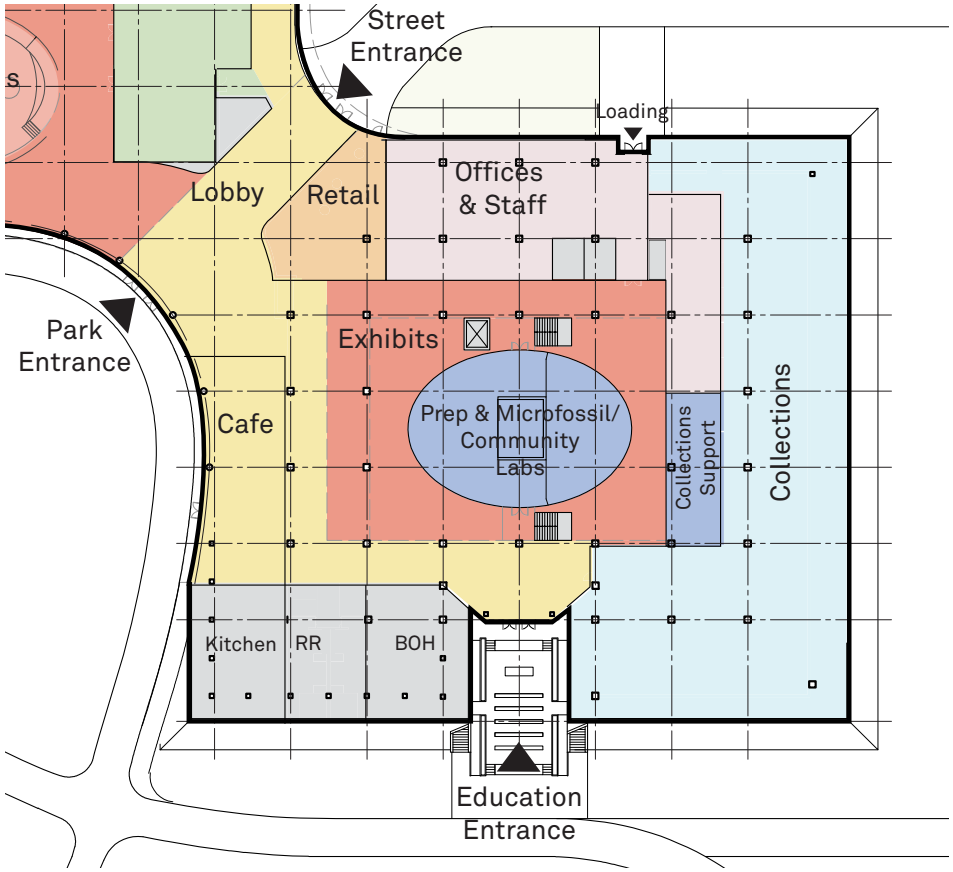
Exhibit opportunties range from large specimen mounts to small-scale interactive collections exhibits that enable new ways to tell the story of La Brea.

Visible Labs & Collections

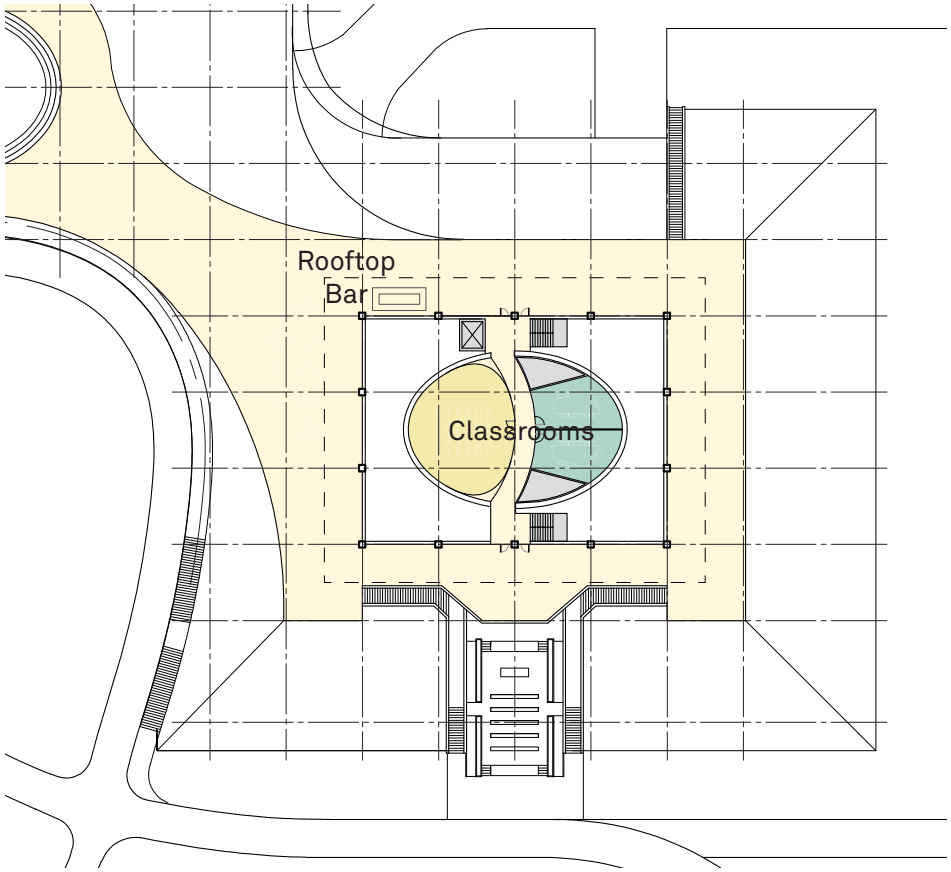
An expanded Fossil Lab and visible collections reveal the impact of research.

Research Gallery
Enlarged Plans

Expanded visible labs and visible collections exhibits reveal the impact of research. Classrooms above have views of exhibits and the park.



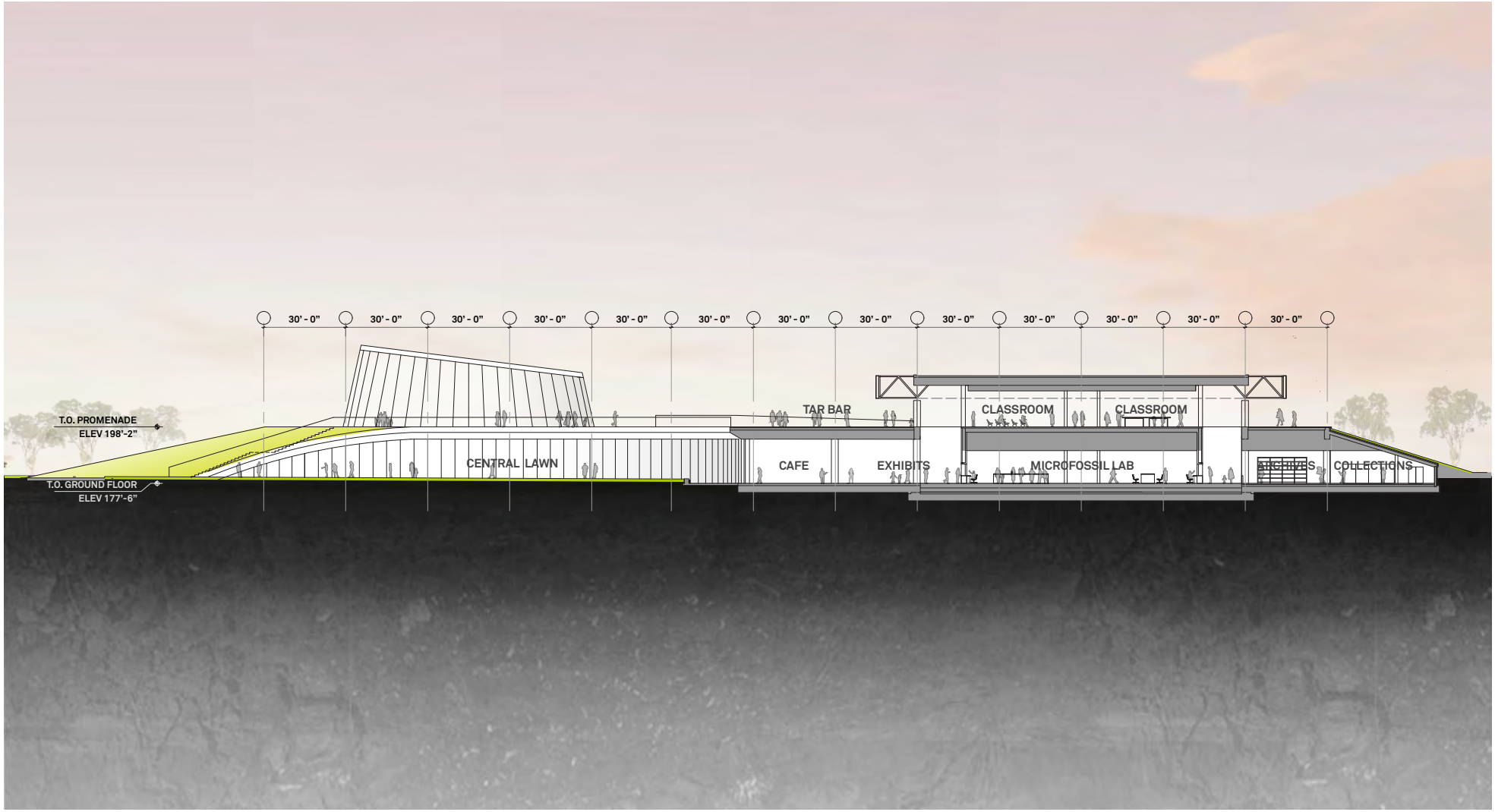
Ground Floor

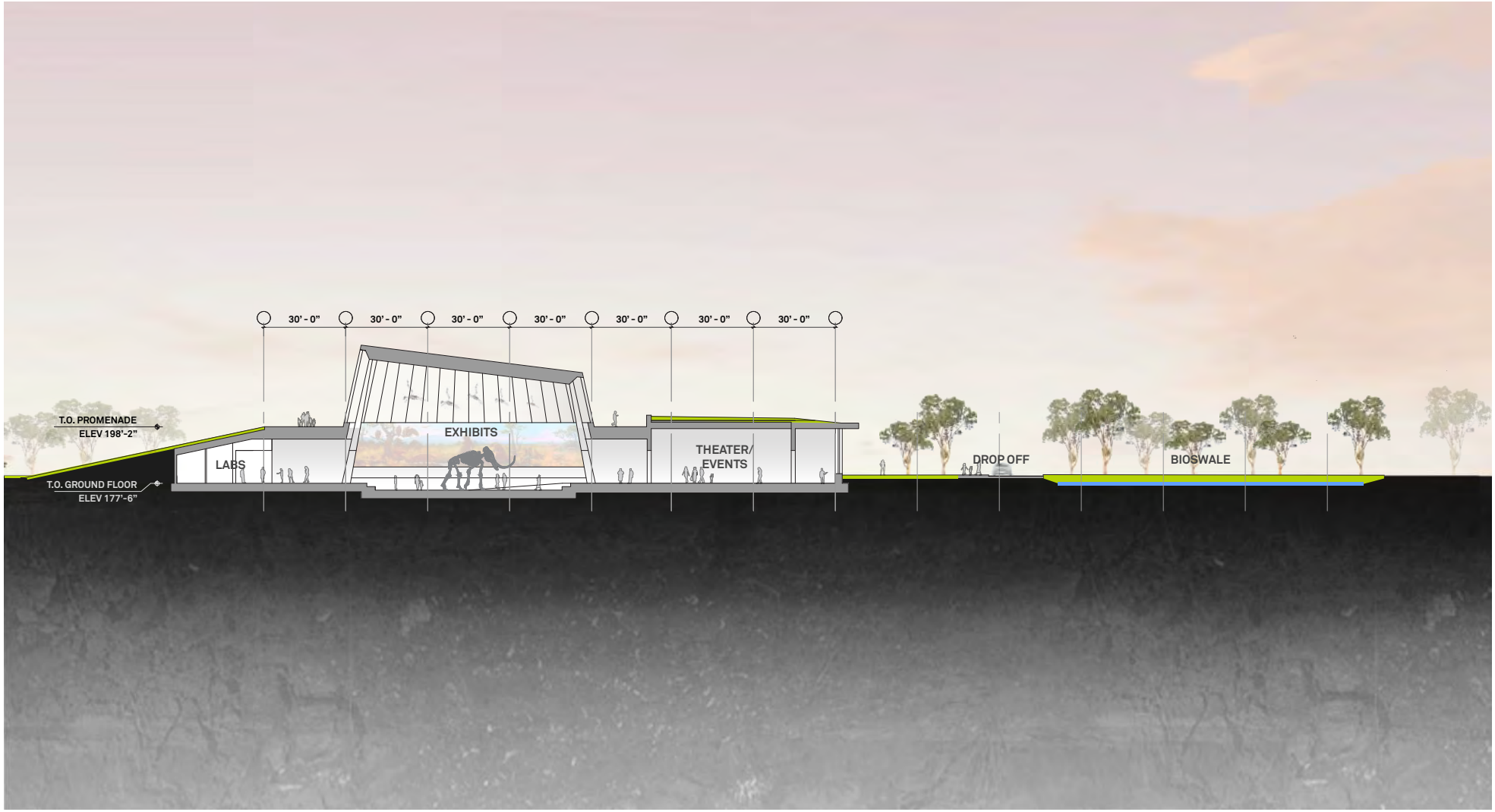


Promenade Level

Building Sections

A new research gallery in the renovated museum along with new exhibitions, galleries, labs, and theaters in the expansion renew the identity of the museum.




30' - 0"
30' - 0"
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30' - 0"
T.O. PROMENADE
ELEV 198'-2"
T.O. GROUND FLOOR
ELEV 177'-6"
LABS
EXHIBITS
THEATER/
EVENTS
DROP OFF
BIOSWALE

Building Program

Through detailed work sessions with NHMLAC Working Groups, a preliminary program range was identified and further refined through site and budgetary considerations.

		Existing	Master Plan
Visitor Experience			
Lobby, Pre-function & Orientation		1,602	4,000
Retail		1,513	1,700
Café		-	3,000
Kitchens, Storage & Support		242	3,210
	Subtotal	**3,357**	**11,910**
Exhibitions			
Exhibitions		19,604	24,000
	Subtotal	**19,604**	**24,000**
Research & Collections			
Labs		2,123	4,450
Collection Storage		8,071	14,500
Research & Collections Support		730	2,080
	Subtotal	**10,924**	**21,030**
Programs & Education			
Theaters		4,366	4,000
Classrooms		950	2,810
Green Room		-	210
	Subtotal	**5,316**	**7,020**

		Existing	Master Plan
Offices & Shared Staff Spaces			
Offices		1,429	3,240
Shared Staff Spaces		288	1,890
	Subtotal	**1,717**	**5,130**
Back of House			
Shop			980
Building Maintenance/Custodial		662	930
Storage		-	2,950
Loading Areas		704	1,100
Circulation		1,900	-
	Subtotal	**3,266**	**5,960**
Total Museum NSF		**44,184**	**75,050**
Total Museum GSF		**63,219**	**104,319**
Other Programmed Space			
Parking		62,990	65,000

Capturing Imagination

The story of La Brea is about the multi-million-year geological continuum, nearly 300 years of Los Angeles's modern history, over a century of technological progress and scientific discovery, and lastly, a day's journey where new stories are created. This incredible story needs to be told not only through words, but also through experience. We are excited for this extraordinary opportunity to reshape La Brea Tar Pits, a site so central to our cultural imagination. The La Brea Tar Pits Master Plan seeks to unify a constellation of critical research sites, buildings, exhibition experiences, programs, and the park with a provocative and inspiring new identity. Loops and Lenses connect and reveal—together they form an intimate journey of discovery and wonder across multiple epochs.

Project Credits

Natural History Museums of Los Angeles County

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APPENDIX C

Air Quality and Greenhouse Gas Technical Report

Air Quality and Greenhouse Gas Technical Report
La Brea Tar Pits Master Plan

Los Angeles, California

AUGUST 2023

PREPARED FOR

Los Angeles County Museum of Natural History Foundation

LEAD AGENCY

County of Los Angeles

PREPARED BY

SWCA Environmental Consultants

AIR QUALITY AND GREENHOUSE GAS TECHNICAL REPORT
LA BREA TAR PITS MASTER PLAN
LOS ANGELES, CALIFORNIA

Prepared for

Los Angeles County Museum of Natural History Foundation

On behalf of

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August 2023

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Air Basin	South Coast Air Basin
AQMP	Air Quality Management Plan
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emission Estimator Model
CalEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAT	California Action Team
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
City	City of Los Angeles
City General Plan	City of Los Angeles General Plan
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of Los Angeles
County General Plan	County of Los Angeles 2035 General Plan
DPM	diesel particulate matter
EO	Executive Order
EPA	U.S. Environmental Protection Agency
Foundation	Los Angeles County Museum of Natural History Foundation
GHG	greenhouse gas
gsf	gross square feet
GWP	global warming potential
H_2S	hydrogen sulfide
HFCs	hydrofluorocarbons
HRA	health risk assessment
HVAC	heating, ventilation, and air conditioning

IPCC	Intergovernmental Panel on Climate Change
IWMA	Integrated Waste Management Act
LACMA	Los Angeles County Museum of Art
LADOT	Los Angeles Department of Transportation
LADWP	Los Angeles Department of Water and Power
LAMC	Los Angeles Municipal Code
LCFS	Low Carbon Fuel Standard
LST	localized significance threshold
Metro	Los Angeles County Metropolitan Transportation Authority
MMT	million metric tons
MT	metric tons
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
O_3	ozone
OEHHA	California Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research
Page Museum	George C. Page Museum
PFCs	perfluorocarbons
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
ppb	parts per billion
ppm	parts per million
project	La Brea Tar Pits Master Plan
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCOTUS	Supreme Court of the United States
SCS	Sustainable Community Strategy
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRA	source receptor area
TAC	toxic air contaminant

TSCA	Toxic Substances Control Act
VMT	vehicle miles traveled
VOC	volatile organic compound
ZEV	Zero Emission Vehicle

EXECUTIVE SUMMARY

This report analyzes potential air quality and climate change impacts related to the La Brea Tar Pit Master Plan. All analyses have been conducted to comply with South Coast Air Quality Management District (SCAQMD) requirements for air quality and climate change assessments and satisfy the requirements of the California Environmental Quality Act (CEQA). The findings are as follows:

- The project's emissions during construction and operations would not exceed SCAQMD regional mass emissions thresholds.
- The project's emissions during construction and operations would not exceed SCAQMD localized significance thresholds.
- Upon implementation of identified mitigation, the project would not result in significant elevated health risks at sensitive receptors due to proximity to nearby pollution sources.
- The project's carbon monoxide (CO) emissions during long-term project operations would not create any new or exacerbate any existing CO hot spots.
- The project would be consistent with air quality policies set forth by SCAQMD and the Southern California Association of Governments, as presented in the region's most recent Air Quality Management Plan.
- The project would not conflict with the state's goal of reducing greenhouse gas emissions to 40% below 1990 levels by 2030.
- The project would not result in a cumulatively considerable air quality impact.

1 INTRODUCTION

The 13-acre La Brea Tar Pits site is located within the eastern and northeastern portions of Hancock Park in Los Angeles, California. The La Brea Tar Pits, the George C. Page Museum (Page Museum), and associated facilities are owned by the County of Los Angeles (County) but are managed by the non-profit Los Angeles County Museum of Natural History Foundation (Foundation). The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the Natural History Museums of Los Angeles County, including the La Brea Tar Pits and Page Museum. The Foundation proposes a redevelopment, or "reimagining," of the La Brea Tar Pits site, including renovation of the Page Museum, constructing a new museum building, and developing new amenities in surrounding portions of Hancock Park.

The County is the Lead Agency under the California Environmental Quality Act (CEQA); the Museum of Natural History is a County departmental unit. The Foundation retained SWCA Environmental Consultants (SWCA) to prepare this Air Quality and Greenhouse Gas Technical Report in support of the proposed La Brea Tar Pits Master Plan (project).

The purpose of this report is to describe the methodologies used to quantify project air pollutant and greenhouse gas (GHG) emissions and to evaluate the air quality and GHG emissions impacts associated with the construction and operation of the project. This air quality technical report also addresses the consistency of the project with applicable state and local regulatory policies pertaining to air quality and GHG emissions, and analysis of whether the project would cause an exceedance of an ambient air quality standard or South Coast Air Quality Management District (SCAQMD) significance threshold. The report includes a health risk assessment (HRA) to evaluate potential project health impacts on nearby sensitive receptors resulting from project construction and operation. The report also includes a discussion of existing conditions in the project site, global climate change, existing regulations pertaining to air quality and climate change, and an inventory of the GHG emissions that would result from the project.

2 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The 13-acre project site is located at 5801 Wilshire Boulevard within the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902) (Figure 1 and Figure 2). The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and is directly adjacent to the Los Angeles County Museum of Art (LACMA). The project site is located approximately 5.5 miles west of downtown Los Angeles and approximately 8.6 miles east of the Pacific Ocean. It is bounded by 6th Street to the north (an approximately 1,200-foot-long frontage), Curson Avenue to the east (an approximately 830-foot-long frontage), Wilshire Boulevard to the south (an approximately 500-foot-long frontage), and LACMA and the Shin'en Kan Pavilion to the west (an approximately 250-foot-long frontage). The area is known as the Miracle Mile neighborhood of Los Angeles. The project site can be found on the U.S. Geological Survey Hollywood, California, 7.5-minute quadrangle in Section 20, Township 1 South, Range 14 West.

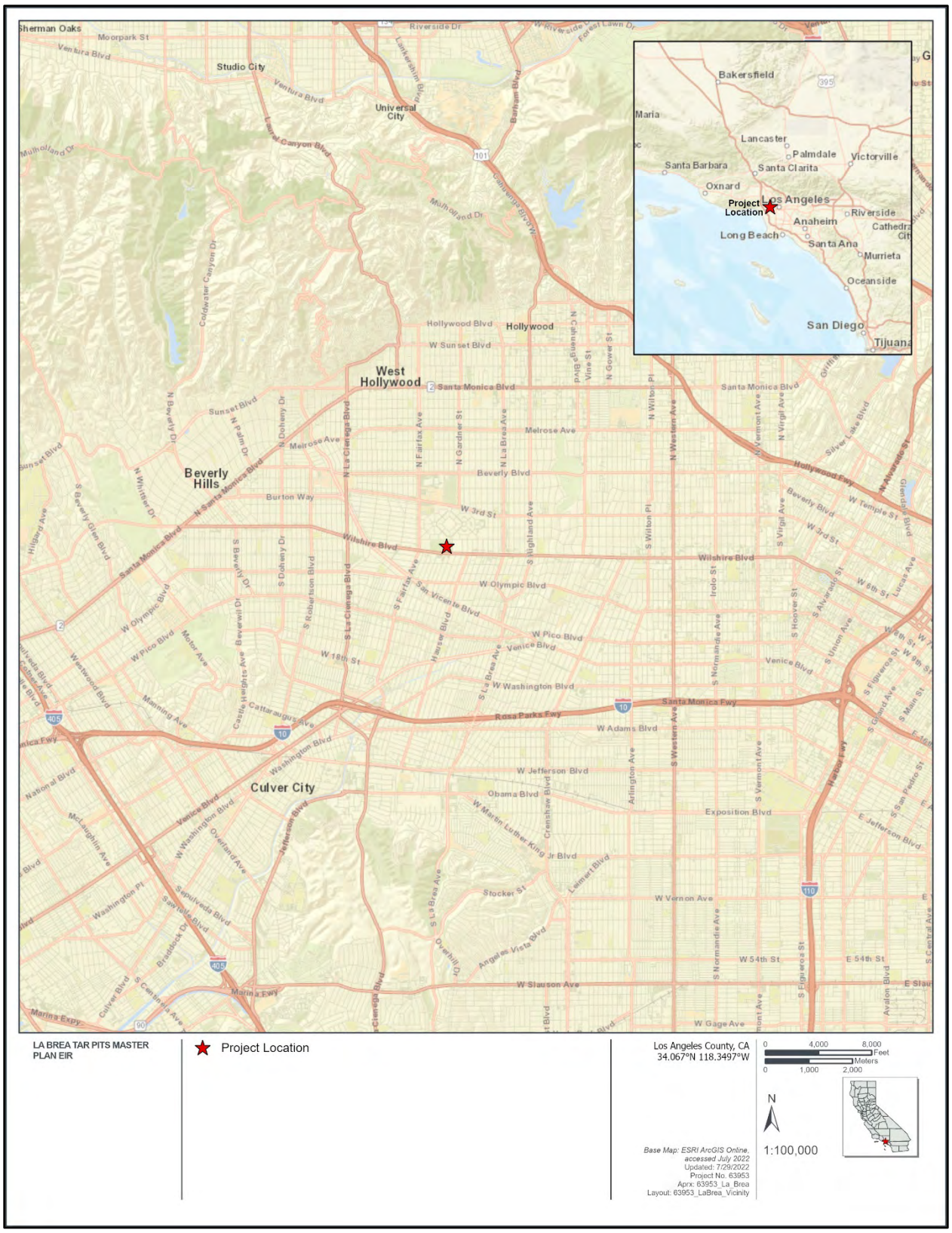

Figure 1. Project vicinity map.

Figure 2. Project location map.

2.2 Existing Conditions and Surrounding Land Uses

The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and broadly encompasses what is known as the La Brea Tar Pits, which includes the Page Museum (see Figure 2). The entirety of Hancock Park is enclosed within an 8- to 10-foot-high metal fence, which serves to secure the site by providing full closure of Hancock Park when the La Brea Tar Pits, Page Museum, and LACMA are closed in the evenings.

The George C. Page Museum is approximately 63,200 square feet and is located on the eastern portion of the project site. The project site contains multiple active fossil quarries, commonly called "tar pits." The active tar pits (Pits 3, 4, 9, 13, 61, 67, and 91) are located within the northwestern portion of the project site, along with the Observation Pit on the western boundary of the project site. Project 23[1] and Pit 91 are active fossil recovery and excavation sites also located in the northwestern portion of the project site. The Lake Pit is largest paleontological excavation pit on the grounds of Hancock Park, located in the southeastern portion of the project site.

The project site includes an approximately 28,000-square-foot multipurpose grass lawn, known as the Central Green, is located to the west of the Page Museum. Parking for the La Brea Tar Pits is located in the northeast corner of the project site, at the corner of South Curson Avenue and West 6th Street (see Figure 2). Vehicles enter and depart the lot from both directions on South Curson Avenue.

The project site is surrounded by a variety of commercial uses, museums, residential buildings, and schools. The project site is bounded by the Park La Brea Pool and multi-family residential uses to the north across West 6th Street, commercial and residential uses to the east across South Curson Avenue, the Craft Contemporary Museum and other museum and commercial uses south across Wilshire Boulevard, and museum and commercial uses to the west (see Figure 2). The nearest school to the project site is Fusion Academy Miracle Mile, a private learning institution for middle school and high school students, located approximately 0.12 mile away, and the nearest daycare is Michal Daycare located approximately 0.28 mile away.

2.3 Project Description

The La Brea Tar Pits Master Plan is a reimagining of the Page Museum and 13 acres of Hancock Park. The objectives of the project are to provide the following: expanded fossil storage facilities that enable access for scientific research; expanded laboratory research facilities; additional exhibition facilities and learning environments within the park and museum facilities; and better access for future research, excavation, and educational interpretation. Another of the County's objectives is to support passive recreational use and enhance connections to the surrounding neighborhood.

A summary of the key project components of the La Brea Tar Pits Master Plan is provided in Table 1. The proposed site plan for the project is provided in Figure 3, and discussed in the sections that follow.

[1] During construction on the LACMA parking garage in 2006, 16 new paleontological deposits were discovered, including an almost-complete skeleton of an adult mammoth. Given the size of the discoveries, 23 large wooden boxes were built around the various deposits, allowing many of the discoveries to remain intact. "Project 23" has now become the short-hand descriptor for the location and activities related to the excavation of deposits within the 23 large wooden boxes that is now occurring in a portion of the La Brea site.

Table 1. Project Components Summary

Project Component	Description
Page Museum Renovations	Renovate existing building in same footprint (approximately 63,200 square feet).
New Museum Building	Construct a new two-story, 40,000-square foot museum building northwest of the Page Museum, including two new theaters. The construction of the new museum building would require the removal of vegetation in the footprint of the new building.
Wilshire Gateway	Renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue with shaded canopy and new welcome pavilion.
Lake Pit	Construct a pedestrian bridge and walking path over the Lake Pit.
6th Street Gateway	Renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA service drive with shaded canopy and new welcome pavilion.
Tar Pit Renovations (Pits 3, 4, 9, 13, 61, 67, and 91; Project 23)	Renovate the existing facilities at all the tar pits in the northwestern portion of the project site. These renovations would require the removal and replacement of some vegetation, although the exact amount and nature of the vegetation removal and enhancements has not been determined at the time of this report.
Pedestrian Path and Recreation Areas	Reconfigure the existing pedestrian pathways on-site into a continuous paved pedestrian path linking existing features on the project site. Provide improvements to the Central Green. Establish a children's play area, picnic areas, and a small dog park west of the 6th Street Gateway.
Circulation and Parking	Expand existing parking lot from 63,000 square feet to 65,000 square feet and relocate it approximately 50 to 70 feet to the north. This would require removal and relocation of existing trees on-site. Increase vehicle parking spaces by approximately five to 15 spaces for a total of 160 to 170 vehicle parking spaces. Add new landscaping and vehicle access lanes to the parking lot. Establish new school drop-off/loading area approximately 215 to 230 feet long on South Curson Avenue adjacent to the Wilshire Gateway picnic area.
Landscaping	Provide a newly renovated park space to include retention and renovation of existing lawn areas and planting of new shrubs and trees, including California native trees, shrubs, and forbs. Establish three distinct landscaping zones encircled by a looping pedestrian path. Create biofiltration areas for stormwater management. Enhancement and rehabilitation of the existing landscaping of the 13-acre portion of Hancock Park would require the removal of some of the existing landscaping and vegetation. The exact location of vegetation removal and rehabilitation has not been determined at the time of this report.

Figure 3. Proposed site plan.

2.3.1 Page Museum Renovations

The Master Plan proposes renovations to the existing Page Museum within the same footprint as the existing building (currently approximately 63,200 square feet) to allow for enlarged exhibition space, additional storage, a ground floor café, and retail space. The central atrium would be renovated to provide additional exhibits and provide additional classroom and laboratory space. The second floor of the Page Museum would contain two classrooms and a multipurpose space. An outdoor café would be located next to these spaces on the center terrace on the west side of the Page Museum. The project would add several sustainability features to the Page Museum. The features include enhanced daylighting, rainwater collection leading to bioswales, a sloped green roof, and incorporation of rooftop solar photovoltaic panels onto the buildings, where possible.[2]

In addition, the project would demolish the existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. A new 2,000-gross-square-foot satellite maintenance and support building would be constructed for additional storage, administration, and research space directly west of the parking lot. Construction of the maintenance and support building is expected to require removal of existing vegetation in the building footprint.

2.3.2 New Museum Building

A new two-story museum building would be located to the northwest of the Page Museum. The building would be approximately 40,000 square feet and would increase the total museum square footage to 104,000 gsf. The new museum building would include an extended central lobby, exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock. The new museum building would require the removal of vegetation where the new building footprint is proposed.

The Page Museum and new museum building would be continuously connected on the first floor. The first-floor central lobby would face southwest toward the Central Green and branch off into the Page Museum to the east and the new museum building to the west. An updated retail and café space would be located off the lobby and look out over the Central Green. The Page Museum and the new museum buildings would be disconnected on the second floor, which would rise above the earthen berm. The separated facilities would be accessible through sloped outdoor walkways from the Central Green or interior staircases in the museum. There would be pedestrian entrances leading into the central lobby from the Central Green and from the parking lot. The existing Page Museum entrance would be converted to an educational group and tour entrance, which would be connected to a new school drop-off area on South Curson Avenue.

2.3.3 Tar Pit Renovations

The project would renovate the existing facilities at all the tar pits in the northeastern portion of the project site. The extended chain fencing around Pits 3, 4, 9, 13, 61, and 67 would be removed. The project would construct clearly defined viewing areas around each of the tar pits. The project would relocate the wooden fossil boxes, research facilities, and ongoing excavation associated with Project 23 to space within and adjacent to the new museum building. The temporary storage and research buildings adjacent to Project 23 would be demolished or repurposed within the project site.

[2] At this stage of the design process, it is undetermined whether it will be feasible to incorporate solar panels on both the new museum building and the existing Page Museum. To the extent it is practicable within other limitations (e.g., existing structural and historic considerations), solar panels would be incorporated.

Pit 91 would continue to be a key research and interpretation destination in the park. The project would demolish the current viewing station overlooking Pit 91 and construct a shaded outdoor classroom with canopy. While excavation at Pit 91 could be completed in a few years, the site would be maintained and enhanced to support future excavation and education opportunities. In addition, the new support facilities at Pit 91 would continue to support temporary excavation sites at adjacent Pit 10 or other future field sites.

2.3.4 Site Entryways and Other Internal Improvements

The project would renovate the existing entrance to the La Brea Tar Pits located at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza; this would provide orientation, spaces for gathering and queuing, and restrooms. A picnic area would also be located under the shaded canopy. A school drop-off area on South Curson Avenue would lead directly to the education museum entrance, enabling the choreography of student tour itineraries that are distinct from general museum visitors and other tour groups.

A pedestrian bridge and walking path would be constructed over the Lake Pit. Directly to the east of the Lake Pit, a new garden bioswale would be installed to manage stormwater and would include vegetation related to the relocated mammoths and mastodon sculptures.

The project would renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA parking garage. Similar to the Wilshire Gateway, a shaded canopy and welcome pavilion would provide orientation, legibility, and amenities. Additional landscape and recreational amenities would be provided and include play areas, picnic areas, and interpretation zones.

2.3.5 Landscaping

The conceptual landscape plan included in the Master Plan envisions the newly renovated park space to include retention of existing lawn areas, shrubs, and trees, supplemented with additional plantings of California native trees, shrubs, and forbs. The Master Plan depicts a preliminary estimate of the existing trees at the site and identifies new and relocated trees. The Master Plan states the intention to preserve existing trees as feasible while incorporating a significant degree of new planting and reducing non-native species such as Mexican fan palms, agaves, and yuccas. The planting strategy includes the introduction or relocation of trees, with the relocated trees moved from existing locations within the project site. Trees that would be removed include non-native species and/or specimens that are diseased and/or not in good health. Trees that conflict with the proposed new construction would be relocated or removed (e.g., trees within the proposed footprint of the shifted parking lot on the northern side of the project site). New plantings would be selected for resilience to disease and with consideration for their ability to create shaded areas at the park.

2.3.6 Project Ground Disturbance

At the time of preparation of this report, final engineering, design, and grading plans for the project had not been finalized. Because the project design is at a preliminary stage, the level of detail needed to determine the precise depth and extent of ground disturbance is not known. However, the level of design that has occurred to-date allows for a general characterization of the overall ground disturbance and excavation that would be necessary for the project. The project design team worked with the Foundation and the County to characterize a “worst-case” ground-disturbance estimate, which represents the most-impactful scenario in terms of depths and amount of excavation that includes all project elements. While separate estimates for each project element (e.g., the new museum building) are not yet available, the

estimate based on the worst-cast scenario provides a reasonable basis on which the potential for impacts to archaeological and tribal cultural resources can be analyzed.

Under the most-impactful scenario, the project would at maximum require excavations 6 to 10 feet below ground, potentially involving 53,000 cubic yards of cut/export and 37,000 cubic yards of imported fill. In general, the new museum building would require the most ground disturbance and excavation. Although the final elevation of the foundation for the new museum building is not known at this time, it may be below the existing ground surface to provide a smooth connection to the existing Page Museum. The expansion of the new parking lot to the north and west of the existing lot would likely also require grading and imported sediments to create a level surface as a base beneath the new surface. Pile-drilling could be required to construct the structural supports for the new walkway over the Lake Pit and possibly the two gateway entrances, and ground disturbances are expected to be approximately consistent with the maximum depths of 10 feet considered for the project but contained with the relatively narrow diameter of the bore and in a limited number of locations. The pedestrian paths, recreation areas, pit renovations, and landscaping would all require shallow to moderate excavation not to exceed approximately 5 feet; deeper excavation could possibly be required for tree planting/removal, although many of the ground-disturbances for these components would be at more shallow depths (e.g., 18 inches), for example to complete smaller plantings and construct/remove pathways. While these project elements are expected to require less excavation than for the new museum, this report assumes that excavations could occur up to 10 feet deep throughout the 13-acre project site to allow maximum flexibility as the project designs become more refined.

In addition, the project would demolish the existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. A new 2,000-square foot satellite maintenance and support building would be constructed for additional storage, administration, and research space directly west of the parking lot.

2.4 Construction Time Frame and Phasing

Construction of the project, from mobilization to the site to final completion, is expected to occur between 2024 and 2028, and would last for approximately 4 years. The project would be constructed in five phases: 1) demolition and site preparation of the project site; 2) installation of infrastructure improvements; 3) development of the proposed new museum building and parking lot; 4) landscaping and hydroseeding; and 5) on-site roadway improvements. All construction activities, including construction staging of equipment, would be situated entirely within the project site. Typical construction equipment would be used during all phases of project construction and would be stored within the staging area, potentially including excavators, dozers, backhoes, dump trucks, water trucks, jackhammers, sand blasters, rollers, pavers, generators, scrapers, forklifts, delivery trucks, paving equipment, cranes, and air compressors. It is assumed that blasting would not be required for project demolition or construction.

3 ENVIRONMENTAL SETTING

The project is located within the South Coast Air Basin (Air Basin), an approximately 6,745-square-mile area bounded by the Pacific Ocean to the west; the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east; and San Diego County to the south. The South Coast Air Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the Coachella Valley area in Riverside County. The regional climate within the Air Basin is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. The air quality within the

Air Basin is primarily influences by meteorology and a wide range of emissions sources, such as dense population centers, heavy vehicular traffic, and industry.

Air pollutant emissions within the Air Basin are generated primarily by stationary and mobile sources. Stationary sources can be divided into two major subcategories: point and area sources. Point sources occur at a specific location and are often identified by an exhaust vent or stack, such as combustion equipment that produces electricity or generates heat. Area sources are widely distributed and include residential and commercial water heaters, agricultural fields, landfills, and others. Mobile sources include emissions from motor vehicles, including tailpipe and evaporative emissions, and are classified as either on-road or off-road. On-road sources may be legally operated on roadways and highways. Off-road sources include aircraft, ships, trains, and self-propelled construction equipment. Air pollutants can also be generated by the natural environment, such as when high winds suspend fine dust particles.

3.1 Overview of Air Pollution and Potential Health Effects

3.1.1 Criteria Air Pollutants

Both the federal and state governments have established ambient air quality standards for outdoor concentrations of specific pollutants in order to protect the public health and welfare. These pollutants are referred to as “criteria air pollutants” and the national and state standards have been set at levels considered safe to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly with a margin of safety; and to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Certain air pollutants have been recognized to cause notable health problems and consequential damage to the environment, either directly or in reaction with other pollutants due to their presence in elevated concentrations in the atmosphere. Such pollutants have been identified and regulated as part of the overall endeavor to prevent further deterioration and facilitate improvement in the air quality with the Air Basin. The criteria air pollutants for which national and state standards have been promulgated and which are most relevant to current air quality planning and regulation in the Air Basin include carbon monoxide (CO), ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, sulfates, and hydrogen sulfide (H_2S). These pollutants, as well as volatile organic compounds (VOCs) and toxic air contaminants (TACs), are discussed in the following paragraphs. The national and state criteria pollutants and the applicable ambient air quality standards are listed in Table 2.

3.1.1.1 OZONE

O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun’s energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and VOCs. The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric ozone) and at the Earth’s surface in the troposphere (ozone). The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered “bad” O_3. Stratospheric, or “good” O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth’s atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2022a). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

3.1.1.2 NITROGEN DIOXIDE

NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO), which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections (EPA 2022a).

3.1.1.3 CARBON MONOXIDE

CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions (EPA 2022a).

3.1.1.4 SULFUR DIOXIDE

SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel (EPA 2022a).

3.1.1.5 PARTICULATE MATTER

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) is 10 microns or less in diameter and is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SOx), NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the bloodstream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in $PM_{2.5}$ and PM_{10} (EPA 2022a).

3.1.1.6 LEAD

Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient (IQ) performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead (EPA 2022a).

3.1.1.7 OTHERS

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere. Sulfates can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. H_2S is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of H_2S include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to H_2S can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

3.1.2 Volatile Organic Compounds

VOCs are typically formed from combustion of fuels and/or released through evaporation of organic liquids. Some VOCs are also classified by the State as TACs. While there are no specific VOC ambient air quality standards, VOC is a prime component (along with NO_x) of the photochemical processes by which such criteria pollutants as O_3, NO_2, and certain fine particles are formed. They are, thus, regulated as “precursors” to the formation of those criteria pollutants.

3.1.3 Toxic Air Contaminants

TACs refer to a diverse group of “non-criteria” air pollutants that can affect human health but have not have ambient air quality standards established for them. This is not because they are fundamentally different from the pollutants discussed above, but because their effects tend to be local rather than regional. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the state of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics “Hot Spots” Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hot spots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

The federal TACs are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health, although there are no ambient standards established for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or other acute (short-term) or chronic (long-term) health problems. For TACs that are known or suspected carcinogens, the CARB has consistently found that there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risks they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health effects, a similar factor, called a Hazard Index, is used to evaluate risk. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). Examples of TAC sources include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources. The TACs that are relevant to the implementation of the project include diesel particulate matter (DPM) and airborne asbestos.

DPM was identified as a TAC by the CARB in August 1998 (CARB 1998). DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40% of the statewide total, with an additional 57% attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3% of emissions, include shipyards, warehouses, heavy-equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report DPM emissions also include heavy construction, manufacturers of asphalt paving materials and blocks, and diesel-fueled electrical generation facilities.

Exposure to DPM can have immediate health effects. DPM can have a range of health effects including irritation of eyes, throat, and lungs, causing headaches, lightheadedness, and nausea. Exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. Children, the elderly, and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. In California, DPM has been identified as a carcinogen.

Naturally occurring asbestos areas are identified based on the type of rock found in the area. Asbestos-containing rocks found in California are ultramafic rocks, including serpentine rocks. Asbestos has been designated a TAC by the CARB and is a known carcinogen. When this material is disturbed in connection with construction, grading, quarrying, or surface mining operations, asbestos-containing dust can be generated. Exposure to asbestos can result in adverse health effects such as lung cancer, mesothelioma (cancer of the linings of the lungs and abdomen), and asbestosis (scarring of lung tissues that results in constricted breathing) (Van Gosen and Clinkenbeard 2011). According to the California Geologic Survey, the project site is not located in an area of naturally occurring asbestos (CARB 2000a).

Asbestos-containing materials become a health hazard once they are disturbed. Intact, asbestos fibers imbedded within construction materials and components are inert and do not pose a health hazard; however, once they are disturbed, through physical contact or building renovation and demolition activities, asbestos fibers may be rendered airborne (SCAQMD 2007).

3.1.4 Odors

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. In a phenomenon known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

A unique feature of the project is the existing subsurface conditions which consist of a relatively thin layer of artificial fill overlying alluvial deposits. The alluvial deposits consist of stiff clay and dense tar-bearing sands. Tar-bearing sands are saturated with hydrocarbons, whereas the upper clay soils contain less hydrocarbons. The presence of the hydrocarbons in the sediments is the result of the project site being over an oil field. Hydrogen sulfide and methane gases generated within the oil field are present in the subsurface. Because the project site is located within an area of known shallow methane and H_2S gas accumulation, crude oil and methane gas leak out from the petroleum deposits and migrate through fractures and faults located within the bedrock until encountering the alluvial soils, where they permeate into the alluvium and continue to travel upward to the ground surface. These unique subsurface conditions

are a potential source of odors due to the presence of H_2S. Many of the light petroleum components are lost to evaporation and biogenic processes, resulting in viscous tar seeping out of the ground surface (Deane et al. 2018). A methane specialist will be developing the ventilation system and barriers to reduce gas seepage into enclosed structures.

Table 2. State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	
			Primary	Secondary
Ozone (O3)	1 hour	0.09 ppm (180 µg/m³)	--	Same as Primary
	8 hour	0.070 ppm (137 µg/m³)	0.070 ppm (137µg/m³)	
Respirable particulate matter (PM10)	24 hour	50 µg/m³	150 µg/m³	Same as Primary
	Annual mean	20 µg/m³	--	
Fine particulate matter (PM2.5)	24 hour	--	35 µg/m³	Same as Primary
	Annual mean	12 µg/m³	12.0 µg/m³	15 µg/m³
Carbon monoxide (CO)	1 hour	20 ppm (23 µg/m³)	35 ppm (40 mg/m³)	--
	8 hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	--
Nitrogen dioxide (NO2)	1 hour	0.18 ppm (339 µg/m³)	100 ppb (188 µg/m³)	--
	Annual mean	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as Primary
Sulfur dioxide (SO_2)	1 hour	0.25 ppm (655 µg/m³)	75 ppb (196 µg/m³)	--
	3 hour	--	--	0.5 ppm (1300 µg/m³)
	24 hour	0.04 ppm (105 µg/m³)	0.14 ppm	--
	Annual mean	--	0.030 ppm	--
Lead	30-day average	1.5 µg/m³	--	--
	Calendarquarter	--	1.5 µg/m³	Same as Primary
	Rolling 3-month average	--	0.15 µg/m³	Same as Primary
Visibility reducing particles	8 hour	10-mile visibility standard, extinction of 0.23 per kilometer	No National Standards	
Sulfates	24 hour	25 µg/m³		
Hydrogen sulfide (H2S)	1 hour	0.03 ppm (42 µg/m³)		
Vinyl chloride	24 hour	0.01 ppm (265 µg/m³)		

Source: CARB (2016)

Notes: ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter; -- = no standard.

3.2 Existing Air Quality Conditions in the Project Area

3.2.1 Regional Air Quality

The Southern California region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatology pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The regional climate within the Air Basin is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity.

The extent and severity of air pollution in the Air Basin is a function of the area's natural physical characteristics (e.g., weather and topography), as well as human-made influences (e.g., land use development patterns, heavy vehicular traffic, and industry). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography affect the accumulation and dispersion of pollutants throughout the Air Basin, making it an area of high pollution potential.

Pollutant concentrations in the Air Basin vary with location, season, and time of day. O_3 concentrations, for example, tend to be lower along the coast, higher in the near inland valleys, and lower in the far inland areas of the Air Bain and adjacent desert. The most severe air pollution throughout the Air Basin occurs from June through September. This condition is generally attributed to the large amount of pollutant emissions, light winds, and shallow vertical atmospheric mixing. This frequently reduces pollutant dispersion, causing elevated air pollution levels. Over the past 30 years, substantial progress has been made in reducing air pollution levels in Southern California (CARB 2018a). However, the Air Basin still fails to meet the national standards for O_3 and $PM_{2.5}$. In addition, Los Angeles County still fails to meet the national standard for lead. On May 24, 2012, the CARB approved the State Implementation Plan revision for the federal lead standard, which the EPA revised in 2008. The State Implementation Plan revision addresses attainment of the federal lead standard in the South Coast Air Basin portion of Los Angeles County, the only area in California designated as nonattainment for lead. Lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011. SCAQMD has the responsibility for ensuring that all national and state air quality standards are achieved and maintained throughout the Air Basin. To meet the standards, SCAQMD has adopted a series of Air Quality Management Plans (AQMPs), discussed below under regulatory setting.

3.2.2 Regional Attainment Status

Depending on whether the applicable ambient air quality standards are met or exceeded, the Air Basin is classified on a federal and state level as being in "attainment" or "nonattainment." The EPA and CARB determine the air quality attainment status of designated areas by comparing ambient air quality measurements from state and local ambient air monitoring stations with the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). These designations are determined on a pollutant-by-pollutant basis. Consistent with federal requirements, an unclassifiable/unclassified designation is treated as an attainment designation. The Air Basin currently fails to meet the NAAQS for lead, O_3, and $PM_{2.5}$. Therefore, Los Angeles County South Coast Air Basin is considered a "non-attainment" area for these pollutants on the federal level. As of September 2022, the Air Basin is also considered in non-attainment for O_3, $PM_{2.5}$, and PM_{10} on the state level (EPA 2022b).

3.2.3 Regional Multiple Air Toxics Exposure Study

The SCAQMD has released an Air Basin-wide air toxics study, the Multiple Air Toxics Exposure Study V (MATES V). The MATES V study was developed to evaluate the cancer risk from toxic air emissions throughout the Air Basin by conducting a comprehensive monitoring program, an updated emissions inventory of TACs, and a modeling effort to fully characterize health risks for those living in the Air Basin. In the past iterations of the MATES study, the air toxics cancer risks were evaluated based on inhalation exposures only. However, in MATES V, the methodology was updated to include multiple exposure pathways, such as oral and dermal. The MATES V study concluded that the average carcinogenic risk from air pollution in the Air Basin is approximately 424 in 1 million over a 70-year duration (SCAQMD 2021a). Mobile sources (e.g., cars, trucks, trains, ships, aircraft, etc.) represent the greatest contributors. Approximately 50% of the risk is attributed to diesel particulate emissions, approximately 25% to other toxic emissions associated with mobile sources (including benzene, butadiene, and carbonyls), and approximately 25% of all carcinogenic risk is attributed to stationary

sources, which include large industrial operations, such as refineries and metal processing facilities, as well as smaller businesses, such as gas stations and chrome plating.

As part of the MATES V study, the SCAQMD prepared a series of maps that shows regional trends in estimated outdoor inhalation cancer risk from toxic emissions, as part of the ongoing effort to provide insight into relative risks. The maps' estimates represent the number of potential cancers per million people associated with a lifetime of breathing air toxics (24 hours per day outdoors for 70 years) in parts of the area. The MATES V map is the most recently available map to represent existing conditions near the project site. The estimated cancer risk for the vast majority of the urbanized area within the Air Basin ranges from 200 to 1,000 cancers per million over a 70-year duration. Generally, the risk from air toxics is lower near the coastline, with higher risks concentrated near large diesel sources (e.g., freeways, airports, and ports).

3.2.4 Local Air Quality

Air pollutants emissions are generated in the local vicinity by stationary and area-wide sources, such as commercial and industrial activity, space and water heating, landscape maintenance, consumer products, and mobile sources primarily consisting of automobile traffic. Motor vehicles are the primary source of pollutants in the local vicinity.

3.2.4.1 EXISTING CRITERIA POLLUTANT LEVELS AT NEARBY MONITORING STATIONS

The SCAQMD maintains a network of air quality monitoring stations located throughout the Air Basin and has divided the Air Basin into 38 source receptor areas (SRAs) in which 31 monitoring stations operate. The project site is located within SRA 1, which covers the Central Los Angeles area.
The monitoring station most representative of the project site is the North Main Street Station, located at 1630 North Main Street in the city of Los Angeles, approximately 7.3 miles east of the project site. Criteria pollutants monitored at this station include PM_{10}, $PM_{2.5}$, O_3, CO, NO_2, lead, and sulfate. Table 3 presents the ambient pollutant concentrations that have been measured in SRA 1 for the period 2018–2020, as well as any exceedances of the NAAQS and CAAQS. The GHG inventory for California for years 2015–2019 is presented in Table 4. The national and state criteria pollutants and the applicable ambient air quality standards are listed above in Table 2.

Table 3. Summary of Ambient Air Quality in the Central Los Angeles Area

Pollutant		Year		
		2018	2019	2020
O_3	Maximum 1-hour concentration (ppm)	0.098	0.085	0.185
	Days exceeding CAAQS (0.09 ppm)	2	0	14
	Maximum 8-hour concentration (ppm)	0.073	0.08	0.118
	Days exceeding NAAQS (0.07 ppm)	4	2	22
	Days exceeding CAAQS (0.07 ppm)	4	2	22
Respirable PM_{10}	Maximum 24-hour concentration (µg/m^3)	81	62	77
	Days exceeding NAAQS (150 µg/m^3)	0	0	0
	Days exceeding CAAQS (50 µg/m^3)	31	3	24
	Annual arithmetic mean (µg/m^3)	34.1	25.5	23
	Does measured AAM exceed CAAQS (20 µg/m^3)?	Yes	Yes	Yes

Pollutant		Year		
		2018	**2019**	**2020**
Fine $PM_{2.5}$	Maximum 24-hour concentration (µg/m^3)	43.8	43.5	47.3
	Days exceeding NAAQS (35 µg/m^3)	3	1	2
	Annual arithmetic mean (µg/m^3)	12.58	10.85	12.31
	Does measured AAM exceed NAAQS/CAAQS (12 µg/m^3)?	Yes	No	Yes
CO	Maximum 1-hour concentration (ppm)	2.0	2.0	1.9
	Days exceeding NAAQS (35.0 ppm)	0	0	0
	Days exceeding CAAQS (20.0 ppm)	0	0	0
	Maximum 8-hour concentration (ppm)	1.7	1.6	1.5
	Days exceeding NAAQS and CAAQS (9 ppm)	0	0	0
NO2	Maximum 1-hour concentration (ppm)	0.0701	0.0697	0.0618
	Days exceeding CAAQS (0.18 ppm)	No	No	No
	Annual arithmetic mean (ppm)	0.0185	0.0177	0.0169
	Does measured AAM exceed NAAQS (0.0534 ppm)?	No	No	No
	Does measured AAM exceed CAAQS (0.03 ppm)?	No	No	No
Sulfur dioxide (SO_2)	Maximum 1-hour concentration (ppm)	0.0179	0.01	0.0038
	Days exceeding CAAQS (0.25 ppm)	0	0	0
	Maximum 24-hour concentration (ppm)	0.003	0.003	0.003
	Days exceeding CAAQS (0.04 ppm)	0	0	0
	Days exceeding NAAQS (0.14 ppm)	0	0	0
	Annual arithmetic mean (ppm)	0.001	0.001	0.001
	Does measured AAM exceed NAAQS (0.030 ppm)?	No	No	No
Lead	Maximum 30-day average concentration (µg/m^3)	0.011	0.012	0.013
	Does measured concentration exceed NAAQS (1.5 µg/m^3)?	No	No	No
	Maximum calendar quarter concentration (µg/m^3)	0.011	0.01	0.011
	Does measured concentration exceed CAAQS (1.5 µg/m^3)?	No	No	No
Sulfates	Maximum 24-hour concentration (µg/m^3)	4.5	5.1	3.3
	Does measured concentration exceed CAAQS (25 µg/m^3)?	No	No	No

Source: SCAQMD (2022b)

Notes: AAM = annual arithmetic mean; ppm = parts per million; µg/m^3 = micrograms per cubic meter

Table 4. California Greenhouse Gas Inventory

Parameter	Unit*	Year				
		2015	**2016**	**2017**	**2018**	**2019**
Transportation	MMT CO_2e	166.2	169.8	171.2	169.6	166.1
	Percentage	38.5%	40.4%	41.2%	40.7%	40.6%
Electric power	MMT CO_2e	84.8	68.6	62.1	63.1	58.8
	Percentage	19.6%	16.3%	14.9%	15.2%	14.4%
Industrial	MMT CO_2e	90.3	89	88.8	89.2	88.2
	Percentage	20.9%	21.2%	21.4%	21.4%	21.5%

Parameter	Unit*	Year				
		2015	2016	2017	2018	2019
Commercial and residential	MMT CO_2e	38.8	40.6	41.3	41.4	43.8
	Percentage	9.0%	9.7%	9.9%	9.9%	10.7%
Agriculture	MMT CO_2e	33.5	33.3	32.5	32.7	31.8
	Percentage	7.8%	7.9%	7.8%	7.9%	7.8%
High global warming potential (GWP)	MMT CO_2e	18.6	19.2	20	20.4	20.6
	Percentage	4.3%	4.6%	4.8%	4.9%	5.0%
Total Net Emissions	MMT CO_2e	**432.2**	**420.5**	**415.9**	**416.4**	**409.3**

Source: California GHG Inventory for 2000–2019 (CARB 2021)

* MMT CO2e = million metric tons carbon dioxide equivalent

3.2.4.2 EXISTING HEALTH RISK IN THE PROJECT VICINITY

Based on the MATES V model, the multi-pathway cancer risk in the area immediately surrounding the project site in the 90036 zip code is approximately 495 in 1 million (SCAQMD 2021b). The cancer risk in this area includes diesel particulate matter, benzene, formaldehyde, and arsenic. However, the cancer risk is predominantly related to nearby sources of diesel particulate (e.g., the Harbor Freeway [I-110]).
In general, the risk at the project site is comparable with other urbanized areas in Los Angeles as air toxics cancer risk in this zip code is higher than 63.0% of the South Coast AQMD population (OEHHA 2021).

OEHHA, on behalf of the California EPA (CalEPA), provides a screening tool called CalEnviroScreen that can be used to help identify California communities disproportionately burdened by multiple sources of pollution. According to CalEnviroScreen, the project is located in the 47th percentile, which means the project site is about average in comparison to other communities within California.

3.2.4.3 SURROUNDING USES

The project site is in a highly urbanized area. As discussed in the project description, the area surrounding the La Brea Tar Pits includes a mix of commercial uses, residential uses, and open spaces. Specifically, the project is bounded by LACMA, Park La Brea Pool, parking lots, commercial and multi-family uses.

3.2.4.4 SENSITIVE USES

Some population groups, including children, elderly, and acutely and chronically ill persons (especially those with cardiorespiratory diseases), are considered more sensitive to air pollution than others.
A sensitive receptor is a person in the population who is particularly susceptible to health effects due to exposure to an air contaminant. The following are land uses where sensitive receptors are typically located:

- schools, playgrounds and childcare centers
- long-term health care facilities
- rehabilitation centers
- convalescent centers
- hospitals
- retirement homes

- residences

The closest sensitive land uses to the project site are residential uses located 87 feet to the east and north of the project. All other air quality sensitive receptors are located at greater distances from the project and would be less impacted by project emissions. Therefore, project impacts are quantified only for these nearest sensitive receptors.

3.3 Greenhouse Gas Setting

Global climate change refers to the changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. There is a general scientific consensus that global climate change is occurring, caused in whole or in part by increased emissions of GHGs that keep the Earth's surface warm by trapping heat in the Earth's atmosphere, in much the same way as glass traps heat in a greenhouse. The Earth's climate is changing because human activities, primarily the combustion of fossil fuels, are altering the chemical composition of the atmosphere through the buildup of GHGs. GHGs are released by the combustion of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect. While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy.

Regarding the adverse effects of global warming, as reported by the Southern California Association of Governments (SCAG): "Global warming poses a serious threat to the economic well-being, public health and natural environment in Southern California and beyond. The potential adverse impacts of global warming include, among others, or production in the quantity and quality of water supply, a rise in sea level, damage to marine and other ecosystems, and an increase in the incidences of infectious diseases" (SCAG 2007:116). Over the past few decades, energy intensity of the national and state economy has been declining due to the shift to a more service-oriented economy. California ranked fifth lowest among the States in carbon dioxide (CO_2) emissions from fossil fuel consumption per unit of gross state product. However, in terms of total CO_2 emissions, "California is second only to Texas in the nation and is the 16th largest source of climate change emissions in the world, exceeding most nations. The SCAG region, with close to half of the state's population and economic activities, is a major contributor to the global warming problem" (SCAG 2007:117).

3.3.1 Greenhouse Gas Background

GHGs include CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Carbon dioxide is the most abundant GHG. Other GHGs are less abundant, but have higher global warming potential than CO_2. Thus, emissions of other GHGs are frequently expressed in the equivalent mass of CO_2, denoted as CO_2e. Forest fires, decomposition, industrial processes, landfills, and consumption of fossil fuels for power generation, transportation, heating, and cooking are the primary sources of GHG emissions. The primary GHGs attributed to global climate change are described below.

3.3.1.1 CARBON DIOXIDE (CO_2)

In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals, and plants, volcanic outgassing, decomposition of organic matter, and evaporation from the oceans. Anthropogenic sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Anthropogenic sources of CO_2

amount to over 30 billion tons per year, globally (Friedlingstein et al. 2022). Natural sources release substantially larger amounts of CO_2. Nevertheless, natural removal processes, such as photosynthesis by land and ocean-dwelling plant species, cannot keep pace with this extra input of human-made CO_2, and, consequently, the gas is building up in the atmosphere.

3.3.1.1.1 Methane (CH_4)

Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH_4 in California.

3.3.1.1.2 Nitrous Oxide (N_2O)

Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion produce N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California.

3.3.1.1.3 Hydrofluorocarbons, Perfluorocarbons, Sulfur Hexafluoride

Hydrofluorocarbons (HFCs) are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol (1987), an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion. Perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no primary aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs.

The magnitude of the impact on global warming differs among the GHGs. The effect each GHG has on climate change is measured as a combination of the volume of its emissions, and its global warming potential (GWP). GWPs are one type of simplifies index based upon radiative properties used to estimate the potential future impacts of emissions of different gases upon the climate system, expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of pounds or tons of CO_2 equivalents (CO_2e). GWP are based on a number of factors, including the radiative efficiency (heat-absorbing ability) of each gas relative to that of CO_2, as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years) relative to that of CO2. The larger GWP, the more that a given gas warms the Earth compared to CO2 over that time period. HFCs, PFCs, and SF_6 have a greater "global warming potential" than CO_2. In other words, these other GHGs have a greater contribution to global warming than CO_2 on a per-mass basis. However, CO_2 has the greatest impact on global warming because of the relatively large quantities of CO_2 emitted into the atmosphere.

A summary of the atmospheric lifetime and GWP of selected gases is presented in Table 5. As indicated in this table, GWPs range from 1 to 23,500 based on IPCC Assessment Reports. IPCC has released three assessment reports (AR4, AR5, and AR6) with updated GWPs, however, CARB reports the statewide GHG inventory using the AR4 GWPs, which is consistent with international reporting standards.

By applying the GWP ratios, project-related equivalent mass of CO_2, denoted as CO_2e emissions can be tabulated in metric tons per year.

Table 5. Global Warming Potentials

Greenhouse Gas	GWP Values for 100-year Time Horizon		
	AR4*	**AR5**	**AR6**
Carbon dioxide (CO_2)	1	1	1
Methane (CH_4)	25	28	Fossil origin – 29.8 Non-fossil origin – 27.2
Nitrous oxide (N_2O)	298	265	273
Select hydrofluorocarbons (HFCs)	124–14,800	4–12,400	–
Sulfur hexafluoride (SF_6)	22,800	23,500	–

Sources: IPCC (2007, 2013, 2022).

* For consistency with the EPA and its Inventory of Greenhouse Gas Reporting, we have represented values from AR4 of the IPCC report in this report.

3.3.2 Greenhouse Gas Emissions Inventories

3.3.2.1 UNITED STATES GHG EMISSIONS

Per the EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2020* (EPA 2022c), total U.S. GHG emissions have decreased by 6.6% from 1990 to 2020; 2005 emissions were 15.8% above 1990 levels. The largest source of GHG emissions from human activities in the United States is from burning of fossil fuels for electricity, heat, and transportation. The latest national GHG emissions are for calendar year 2020, in which total gross U.S. GHG emissions were reported at 5,981.4 million metric tons carbon dioxide equivalent (MMT CO_2e). Emissions decreased from 2019 to 2020 by 543.4 MMT CO_2e and net emissions (including sinks) were 5,222.4 MMT CO_2e.

3.3.2.2 STATEWIDE GHG EMISSIONS

According to California's 2000–2019 GHG emissions inventory, California emitted 409.3 MMT CO_2e in 2019 (CARB 2021). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high global-warming potential substances, and recycling and waste. The California GHG emission source categories (as defined in CARB's 2008 Scoping Plan) and their relative contributions in 2019 are presented in Table 4. Total GHG emissions in 2019 were approximately 22.9 MMT CO_2e less than 2016 emissions. Based on data presented, the 2016 statewide GHG inventory fell below 1990 levels, consistent with AB 32 (CARB 2018b). The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California will continue to reduce emissions below the 2020 target of 431 metric tons CO_2e ($MTCO_2e$) (CARB 2022a).

3.3.2.3 COUNTY OF LOS ANGELES EMISSIONS

In 2015, emissions generated by community activities occurring in the county amounted to 5.5 MMT CO_2e. The transportation and stationary energy sectors were the largest contributors to the inventory. The transportation sector accounts for approximately 2.8 MMT CO_2e (51%) of total GHG emissions, while the stationary energy sector accounts for approximately 1.9 MMT CO_2e (35%) of total GHG

emissions. The transportation sector includes emissions from on-road passenger vehicles, trucks, and railways. The stationary energy sector includes emissions from residential, commercial, and institutional uses; industrial buildings; and stationary equipment. The remaining emissions sources include waste and wastewater (8%), refrigerants and other industrial products (5%), and other land-related activities including forestry and agriculture (1%).

To capture the latest emissions profile and emissions trends in Los Angeles County since 2015, the County prepared an updated inventory for the year 2018, given the availability in that year of the most recent complete data set of emissions-generating activity. Both the 2015 and the updated 2018 inventory are discussed in detail in the Los Angeles County revised draft 2045 Climate Action Plan (County of Los Angeles 2023). The 2018 inventory relies on the same protocol and data sources that were used in the 2015 GHG emissions inventory. In 2018, communitywide emissions totaled 5.2 MMT CO_2e.
The transportation sector was the greatest contributor, accounting for 52% of emissions and 2.7 MMT CO_2e. The stationary energy sector was the second greatest contributor at 33% and 1.7 MMT CO_2e. Total GHG emissions decreased approximately 7% between 2015 and 2018. The stationary energy sector saw the greatest decrease (11%), followed by the industrial processes and product use sector (6%) and the transportation sector (5%). Emissions from stationary energy decreased primarily because of the increasing level of renewable energy supplied by Southern California Edison into the electricity grid and because certain power-generating facilities decreased their fossil fuel combustion in the intervening years. Emissions from transportation decreased primarily because of vehicle turnover to more fuel-efficient vehicles.

4 REGULATORY SETTING

Federal, state, and local agencies have set ambient air quality standards for certain air pollutants through statutory requirements and have established regulations and various plans and policies to maintain and improve air quality, as described below.

4.1 Federal

4.1.1 Federal Clean Air Act

4.1.1.1 AIR QUALITY

The federal Clean Air Act (CAA), which was passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The CAA delegates primary responsibility for clean air to the EPA. The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the act, the EPA has established the NAAQS for six criteria air pollutants that are pervasive in urban environments and for which state and national health-based ambient air quality standards have been established. Ozone (O_3), CO, NO_2, SO_2, lead, and particulate matter (PM_{10} and $PM_{2.5}$) are the six criteria air pollutants. Ozone is a secondary pollutant; NO_X and VOCs are of particular interest as they are precursors to ozone formation. The NAAQS are divided into primary and secondary standards; the primary standards are set to protect human health within an adequate margin of safety, and the secondary standards are set to protect environmental values, such as plant and animal life. The standards for all criteria pollutants are presented in Table 2.

The CAA requires the EPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The act also mandates that the State submit and implement a State Implementation Plan

for areas not meeting the NAAQS. These plans must include pollution control measures that demonstrate how the standards will be met.

4.1.1.2 GREENHOUSE GAS EMISSIONS

The Supreme Court of the United States (SCOTUS) ruled in Massachusetts v. Environmental Protection Agency, 127 S.Ct. 1438 (2007), that CO_2 and other GHGs are pollutants under the federal CAA, which the EPA must regulate if it determines they pose an endangerment to public health or welfare. SCOTUS did not mandate that the EPA enact regulations to reduce GHG emissions. Instead, SCOTUS found that the EPA could avoid taking action if it found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining that GHGs contribute to climate change.

On April 17, 2009, the EPA issued a proposed finding that GHGs contribute to air pollution that may endanger public health or welfare. On April 24, 2009, the proposed rule was published in the Federal Register under Docket ID No. EPA-HQ-OAR-2009~0171. The EPA stated that high atmospheric levels of GHGs "are the unambiguous result of human emissions and are very likely the cause of the observed increase in average temperatures and other climatic changes." The EPA further found that "atmospheric concentrations of greenhouse gases endanger public health and welfare within the meaning of Section 202 of the Clean Air Act." The findings were signed by the EPA Administrator on December 7, 2009. The final findings were published in the Federal Register on December 15, 2009. The final rule was effective on January 14, 2010. While these findings alone do not impose any requirements on industry or other entities, this action is a prerequisite to regulatory actions by the EPA, including, but not limited to, GHG emissions standards for light-duty vehicles.

On July 20, 2011, the EPA published its final rule deferring GHG permitting requirements for CO_2 emissions from biomass-fired and other biogenic sources until July 21, 2014. Environmental groups challenged the deferral. In September 2011, EPA released an "Accounting Framework for Biogenic CO2 Emissions from Stationary Sources," which analyses accounting methodologies and suggests implementation for biogenic CO_2 emitted from stationary sources.

On April 4, 2012, the EPA published a proposed rule to establish, for the first time, a new source performance standard for GHG emissions. Under the proposed rule, new fossil fuel–fired generating units larger than 25 megawatts are required to limit emissions to 1,000 pounds of CO_2 per megawatt-hour on an average annual basis, subject to certain exceptions.

On April 17, 2022, the EPA issued emission rules for oil production and natural gas production and processing operations, which are required by the CAA under Title 40 of the Code of Federal Regulations (CFR) Parts 60 and 63. The final rules include the first federal air standards for natural gas wells that are hydraulically fractured, along with requirements for several other sources of pollution in the oil and gas industry that currently are not regulated at the federal level.

4.1.2 Toxic Substance Control Act

The Toxic Substances Control Act (TSCA) of 1976 provides the EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. TSCA became law on October 11, 1976 and became effective on January 1, 1977. The TSCA authorized the EPA to secure information on all new and existing chemical substances, as well as to control any of the substances that were determined to cause unreasonable risk to public health or the environment. Congress later added additional titles to the Act, with this original part designated at Title I – Control of Hazardous Substances. TSCA regulatory authority and program implementation rests predominantly with the federal government (i.e., the EPA). However, the EPA can authorize States to operate their own, EPA-authorized programs for some portions of the statute. TSCA Title IV allows States the flexibility to

develop accreditation and certification programs and work practice standards for lead-related inspection, risk assessment, renovation, and abatement that are at least as protective as existing federal standards.

4.1.3 National Emission Standards for Hazardous Air Pollutants (Asbestos)

The EPA's air toxics regulation for asbestos is intended to minimize the release of asbestos fibers during activities involving the handling of asbestos. Asbestos was one of the first hazardous air pollutants regulated under the air toxics program as there are major health effects associated with asbestos exposure (lung cancer, mesothelioma, and asbestosis). On March 31, 1971, the EPA identified asbestos as a hazardous pollutant, and on April 6, 1973, EPA promulgated the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), currently found in 40 CFR 61(M). The Asbestos NESHAP has been amended several times, most comprehensively in November 1990. In 1995, the rule was amended to correct cross-reference citations to Occupational Safety and Health Administration, Department of Transportation, and other EPA rules governing asbestos. Air toxics regulations under the CAA have guidance on reducing asbestos in renovation and demolition of buildings; institutional, commercial, and industrial building; large-scale residential demolition; exceptions to the asbestos removal requirements; asbestos control methods; waste disposal and transportation; and milling, manufacturing, and fabrication.

4.2 State

4.2.1 California Clean Air Act

The California Clean Air Act (CCAA) was adopted by the CARB in 1988. The CCAA requires that all air districts in the state endeavor to achieve and maintain CAAQS for Ozone, CO, SO2, and NO2 by the earliest practical date. The CCAA specifies that districts focus particular attention on reducing the emissions from transportation and area-wide emission sources, and the act provides districts with authority to regulate indirect sources. The CARB and local air districts are responsible for achieving CAAQS, which are to be achieved through district-level AQMPs that would be incorporated into the State Implementation Plan. In California, the EPA has delegated authority to prepare State Implementation Plans to CARB, which in turn, has delegated that authority to individual air districts. Each district plan is required to either 1) achieve a 5% annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or 2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

The State of California began to set its ambient air quality standards (i.e., CAAQS) in 1969, under the mandate of the Mulford-Carrell Act. The CCAA requires all air districts of the state to achieve and maintain the CAAQS by the earliest practical date. Table 2 shows the CAAQS currently in effect for each of the criteria pollutants, as well as the other pollutants recognized by the State. As shown in Table 2, the CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, H_2S, vinyl chloride, and visibility-reducing particles.

4.2.2 California Code of Regulations

The California Code of Regulations (CCR) is the official compilation and publication of regulations adopted, amended, or repealed by the state agencies pursuant to the Administrative Procedure Act. The CCR includes regulations that pertain to air quality emissions. Specifically, Section 2485 in Title 13 of the CCR states that the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds) during construction shall be limited to 5 minutes at any location. In addition, Section 93115 in Title 17 of

the CCR states that operation of any stationary, diesel-fueled, compression-ignition engine shall meet specified fuel and fuel additive requirements and emission standards.

4.2.3 Toxic Air Contaminants Regulations

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act of 1983 (AB 1807, also known as the Tanner Air Toxics Act) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588 – Connelly). In the early 1980s, the CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Air Toxics Act (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks (CARB 2011).

In August 1998, CARB identified DPM emissions from diesel-fueled engines as a TAC. In September 2000, CARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles (CARB 2000b). The goal of the plan is to reduce diesel PM_{10} (inhalable particulate matter) emissions and the associated health risk by 75% in 2010, and by 85% by 2020. The plan identified 14 measures that target new and existing on-road vehicles (e.g., heavy-duty trucks and buses, etc.), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps, etc.), and stationary engines (e.g., stand-by power generators, etc.). During the control measure phase, specific statewide regulations designed to further reduce DPM emissions from diesel-fueled engines and vehicles were evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce DPM emissions. The project would be required to comply with applicable diesel control measures.

SCAQMD has adopted two rules to limit cancer and noncancer health risks from facilities located within its jurisdiction. Rule 1401 (New Source Review of Toxic Air Contaminants) regulates new or modified facilities, and Rule 1402 (Control of Toxic Air Contaminants from Existing Sources) regulates facilities that are already operating. Rule 1402 incorporates requirements of the AB 2588 program, including implementation of risk reduction plans for significant risk facilities.

4.2.4 Energy Independence and Security Act

The Energy Independence and Security Act of 2007 facilitates the reduction of national GHG emissions by requiring the following:

- increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- requiring approximately 25% greater efficiency for lightbulbs by phasing out incandescent lightbulbs between 2012 and 2014; requiring approximately 200% greater efficiency with lightbulbs, or similar energy savings, by 2020; and
- while superseded by the EPA and NHTSA actions described above, 1) establishing miles-per-gallon targets for cars and light trucks, and 2) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

Additional provisions of the Energy Independence and Security Act address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

4.2.5 Executive Order S-3-05, Executive Order B-30-15, and Executive Order B-55-18

In 2005, the governor issued EO S-3-05, establishing statewide GHG emissions reduction targets, as well as a process to ensure the targets are met. The order directed the Secretary of the CalEPA to report every 2 years on the State's progress toward meeting the governor's GHG emission reduction targets.
The statewide GHG targets established by Executive Order S-3-05 are as follows:

- By 2010, reduce to 2000 emission levels,
- By 2020, reduce to 1990 emission levels, and
- By 2050, reduce to 80% below 1990 levels.

EO B-30-15, issued by Governor Brown in April 2015, established an additional statewide policy goal to reduce GHG emissions 40% below their 1990 levels by 2030. Reducing GHG emissions by 40% below 1990 levels in 2030 and by 80% below 1990 levels by 2050 (consistent with EO S-3-05) aligns with scientifically established levels needed in the United States to limit global warming below 2 degrees Celsius.

The State Legislature adopted equivalent 2020 and 2030 statewide targets in the California Global Warming Solutions Act of 2006 (also known as AB 32) and Senate Bill (SB) 32, respectively, both of which are discussed below. However, the legislature has not yet adopted a target for the 2050 horizon year. As a result of EO S-3-05, the California Action Team (CAT), led by the Secretary of CalEPA, was formed. The CAT is made of representatives from a number of state agencies and was formed to implement global warming emission reduction programs and to report on the progress made toward meeting statewide targets established under the EO. The CAT reported several recommendations and strategies for reducing GHG emissions and reaching the targets established in the EO.

The CAT stated that "smart" land use is an umbrella term for strategies that integrate transportation and land use decisions. Such strategies generally encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors. These strategies develop more efficient land use patterns within each jurisdiction or region to match population increases, workforce, and socioeconomic needs for the full spectrum of the population. "Intelligent transportation systems" is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and the movement of people, goods, and service.

EO B-55-18, issued by Governor Brown in September 2018, establishes a new statewide goal to achieve caron neutrality as soon as possible, but no later than 2045, and achieve and maintain net negative emissions thereafter. Based on this executive order, CARB would work with relevant state agencies to develop a framework for implementation and accounting that tracks progress toward this goal, as well as ensuring future scoping plans identify and recommend measures to achieve the carbon neutrality goal.

4.2.6 Assembly Bill 32 — California Global Warming Solution Act

The California Global Warming Solutions Act of 2006 (also known as AB 32) commits the State to achieving the following:

- By 2010, reduce to 2000 GHG emission levels, and
- By 2020, reduce to 1990 levels.

To achieve these goals, which are consistent with the California CAT GHG targets for 2010 and 2020, AB 32 mandates that the CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions from stationary sources consistent with the CAT strategies, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. In order to achieve the reductions, AB 32 requires CARB to adopt rules and regulations in an open, public process that achieves the maximum technologically feasible and cost-effective GHG reductions.

SB 32, signed September 8, 2016, updates AB 32 to include an emissions reduction goal for the year 2030. Specifically, SB 32 requires CARB to ensure that statewide GHG emissions are reduced to 40% below the 1990 level by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, imposing tighter limits on the carbon content of gasoline and diesel fuel, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

4.2.7 Climate Change Scoping Plan

In 2008, CARB approved a Climate Change Scoping Plan, as required by AB 32. Subsequently, CARB approved updates of the Climate Change Scoping Plan in 2014 (First Update) and 2017 (2017 Update), with the 2017 Update considering SB 32 (adopted in 2016) in addition to AB 32 (CARB 2014, 2017a). The First Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals (to the level of 427 MMT CO_2e) defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use. In May 2022, a draft 2022 Scoping Plan Update was circulated for review, with an errata issued by CARB September 21, 2022, to correct several typographical errors. This draft 2022 Scoping Plan Update assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan Update, which will likely be adopted by the end of 2022, focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

4.2.8 Assembly Bill 197

AB 197, signed September 8, 2016, is a bill linked to SB 32 that prioritizes efforts to reduce GHG emissions in low-income and minority communities. AB 197 requires the CARB to make available, and update at least annually on its website, the emissions of GHGs, criteria pollutants, and TACs for each facility that reports to CARB and air districts. In addition, AB 197 adds two members of the legislature to the CARB board as ex officio, non-voting members, and also creates the Joint Legislative Committee on Climate Change Policies to ascertain facts and make recommendations to the legislature concerning the State's programs, policies, and investments related to climate change.

4.2.9 Cap-and-Trade Program

The 2008 Climate Change Scoping Plan identified a cap-and-trade program as one of the strategies for California to reduce GHG emissions. The cap-and-trade program is a key element in California's climate plan. It sets a statewide limit on sources responsible for 85% of California's GHG emissions and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The cap-and-trade rules came into effect on January 1, 2013, and apply to large electric power plants and large industrial plants. In 2015, fuel distributors, including distributors of heating and transportation fuels, also became subject to the cap-and-trade rules. At that stage, the program will encompass around 360 businesses throughout California and nearly 85% of the state's total GHG emissions. Covered entities subject to the cap-and-trade program are sources that emit more than 25,000 $MTCO_2e$ per year. Triggering of the 25,000 $MTCO_2e$ per year "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (Mandatory Reporting Rule).

Under the cap-and-trade regulation, companies must hold enough emission allowances to cover their emissions and are free to buy and sell allowances on the open market. California held its first auctions of GHG allowances on November 14, 2012 and February 19, 2013. The State has continued conducting tightly controlled auctions for GHG allowances every quarter. California's GHG cap-and-trade system was projected to reduce GHG emissions to 1990 levels by the year 2020, and is projected to achieve an approximate 80% reduction from 1990 levels by 2050.

4.2.10 California Renewables Portfolio Standard

The California Renewable Portfolio Standard (RPS) program (SB 1078; 2002) requires that 20% of the available energy supplies are from renewable energy sources by 2017. In 2006, SB 107 accelerated the 20% mandate to 2010. These mandates apply directly to investor-owned utilities. On April 12, 2011, Governor Brown signed into law SB 2X, which modified the California RPS program to require that both public- and investor-owned utilities in California receive at least 33% of their electricity from renewable sources by the year 2020. SB 2X also requires regulated sellers of electricity to meet an interim milestone of procuring 25% of their energy supply from certified renewable sources by 2016. These levels of reduction are consistent with the Los Angeles Department of Water and Power's (LADWP's) commitment to achieve 35% renewables by 2020. LADWP indicated that 35.2% of its electricity came from renewable resources in year 2021 (LADWP 2021). Therefore, under SB 2X, LADWP currently meets its RPS requirement. Nearly all residents and businesses in unincorporated Los Angeles County receive 50% of their energy from renewable sources as part of the County's commitment to reducing GHG emissions (County of Los Angeles 2021). At its December 7, 2021, meeting, the Los Angeles County Board of Supervisors approved a measure that changed the default energy offering in unincorporated homes to 100% renewable, and most of the renewable energy will be produced in California. This is consistent with one of the targets set by the OurCounty Countywide Sustainability Plan (County of Los Angeles 2019), which calls for eliminating all fossil fuels in the county by 2050, supporting policies and programs to reduce air and climate pollution, and preparing communities for the damaging impacts of climate change.

4.2.11 Senate Bill 350

SB 350, signed October 7, 2015, is the clean Energy and Pollution Reduction Act of 2015. The objectives of SB 350 are 1) to increase the procurement of electricity from renewable sources from 33% to 50% by the end of 2030; and 2) to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

4.2.12 Senate Bill 100

SB 100, signed September 10, 2018, is the 100 Percent Clean Energy Act of 2018. SB 100 updates the goals of California's RPS and SB 350, as discussed above, to the following: achieve a 50% renewable resources target by December 31, 2026, and achieve a 60% target by December 31, 2030. SB 100 also requires that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% procured to serve all state agencies by December 31, 2045.

4.2.13 Senate Bill 1368

SB 1368, signed September 29, 2006, is a companion bill to AB 32, which requires the California Public Utilities Commission and the California Energy Commission (CEC) to establish GHG emission performance standards for the generation of electricity. These standards also generally apply to power that is generated outside of California and imported into the state. SB 1368 provides a mechanism for reducing the emissions electricity providers, thereby assisting CARB to meet its mandate under AB 32. On January 25, 2007, the California Public Utilities Commission adopted an interim GHG emissions performance standard, which is a facility-based emission standard requiring that all new long-term commitments for baseload generation to serve California customers be with power plants that have GHG emissions no greater than a combined-cycle gas turbine plant. That level is established at 1,100 pounds of CO_2 per megawatt-hour. Furthermore, on May 23, 2007, the CEC adopted regulations that establish and implement an identical emissions performance standard of 1,100 pounds of CO_2 per megawatt-hour.

4.2.14 Assembly Bill 1493 (Pavley I)

AB 1493, passed in 2002, requires the development and adoption of regulations to achieve the maximum feasible reduction in GHG emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the state. CARB originally approved regulations to reduce GHG from passenger vehicles in September 2004, which took effect in 2009. On September 24, 2009, CARB adopted amendments to these regulations that reduce GHG emissions and new passenger vehicles from 2009 through 2016. Although setting emission standards on automobiles is solely the responsibility of the EPA, the federal CAA allows California to set state-specific emission standards on automobiles, and the State first obtains a waiver from the EPA. The EPA granted California that waiver until July 1, 2009. The comparison between the AB 1493 standards and the federal Corporate Average Fuel Economy standards was completed by CARB, and the analysis determined the California emission standards were 16% more stringent through the 2016 model year and 18% more stringent for the 2020 model year. CARB is also committed to further strengthening these standards beginning with 2020 model year vehicles, to obtain a 45% GHG reduction in comparison to 2009 model years.

In March 2020, the EPA issued the Safer Affordable Fuel-Efficient Vehicles Rule (SAFE) which would roll back feel economy standards and revoke California's waiver. Under this rule, EPA would amend certain average fuel economy and GHG standards for passenger cars covering model years 2021 through 2026. In September 2019, the EPA withdrew the waiver had previously provided in California for the states GHG and Zero Emission Vehicle (ZEV) programs under Section 209 of the Clean Air Act. The withdrawal of the waiver beginning effective on Novembe[r] 26th, 2019. In response, several states including California have a lawsuit challenging the withdrawal of the EPA waiver. These actions continue to be challenged in court. As noted above, on January 20, 2021, President Biden issued an executive order directing all executive departments and agencies to take action, as appropriate, to address federal regulations and other actions taken during the last 4 years that conflict with the administration's climate and environmental justice goals, which include SAFE.

4.2.15 Executive Order S-01-07 (California Low Carbon Fuel Standard)

EO S-01-07, the Low Carbon Fuel Standard (LCFS) (issued January 18, 2007), requires a reduction of at least 10% in the carbon intensity of California transportation fuels by 2020. Regulatory proceedings and implementation of the LCFS was directed to CARB. CARB released a draft version of the LCFS in October 2008. The final regulation was approved by the Office of Administrative Law and filed with the Secretary of State on January 12, 2010; the LCFS became effective on the same day.

The 2017 update has identified LCFS as a regulatory measure to reduce GHG emission to meet the 2030 emissions target. In calculating statewide emissions and targets, the 2017 update has assumed the LCFS be extended to an 18% reduction in carbon intensity beyond 2020. On September 27, 2018, CARB approved a rulemaking package that amended the LCFS to relax the 2020 carbon intensity reduction from 10% to 7.5%, and to require a carbon intensity reduction of 20% by 2030.

4.2.16 Advanced Clean Car Regulations

In 2012, CARB approved the Advanced Clean Cars program, a new emissions control program for model years 2015 through 2025. The components of the advance clean car standards include the Low-Emission Vehicle regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero Emission Vehicle regulation, which requires manufacturers to produce an increasing number of pure ZEVs, with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years period. In March 2017, CARB voted unanimously to continue with the vehicle GHG emission standards and the ZEV programs for cars and light trucks sold in California through 2025.

4.2.17 Senate Bill 375

This bill requires CARB to set regional emissions reduction targets for passenger vehicles.
The Metropolitan Planning Organization for each region must then develop a “Sustainable Communities Strategy” (SCS) that integrates transportation, land use, and housing policies to plan how it will achieve the emissions target for its region. If the SCS is unable to achieve the regional GHG emissions reductions targets, then the Metropolitan Planning Organization is required to prepare an alternative planning strategy that shows how the GHG emissions reduction target can be achieved through alternative development patterns, infrastructure, and/or transportation measures.

As required under SB 375, CARB is required to update regional GHG emission targets every 8 years, with last update formally adopted March 2018. As part of the 2018 update, CARB has adopted a passenger vehicle–related GHG reduction target of 19% by 2035 for the SCAG region, which is more stringent than the previous reduction target of 13% for 2035.

4.2.18 California Appliance Efficiency Regulations (Title 20, Sections 1601–1608)

The 2014 Appliance Efficiency Regulations, adopted by the CEC, include standards for new appliances (e.g., refrigerators) and lighting, if they are sold or offered for sale in California. These standards include minimum levels for operating efficiency, and other cost-effective measures, to promote the use of energy- and water-efficient appliances.

4.2.19 California Building Energy Efficiency Standards (Title 24, Part 6)

California's Energy Efficiency Standards for Residential and Nonresidential Buildings, codified in Title 24, Part 6 of the CCR and commonly referred to as "Title 24", were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.

The 2022 Title 24 Standards go into effect January 1, 2023. The 2022 standards continue to improve upon the previous (2019) Title 24 standards for new construction of, and additions and alterations to, residential and non-residential buildings. The 2022 Title 24 Standards ensure that builders use the most energy-efficient and energy-conserving technologies and construction practices. Nonresidential buildings are projected to use approximately 30% less energy, due mainly to lighting upgrades. Compliance with Title 24 is enforced through the building permit process.

4.2.20 California Green Building Standards (CALGreen Code)

The California Green Building Standards Code—Part 11, Title 24, CCR—known as CALGreen, is the first-in-the-nation mandatory green building standards code. In 2007, California Building Standards Commission developed green building standards in an effort to meet the goals of California's landmark initiative AB 32, which established a comprehensive program of cost-effective reductions of GHGs to 1990 levels by 2020.

The California Building Standards Commission has the authority to propose CALGreen standards for nonresidential structures that include new buildings or portions of new buildings, additions and alterations, and all occupancies where no other state agency has the authority to adopt green building standards applicable to those occupancies. This code features:

- Regulations for energy efficiency, water efficiency and conservation, material conservation and resource efficiency, environmental quality, and more.
- Mandatory provisions for commercial, residential, and public school buildings.
- Appendices with voluntary provisions for all of these occupancies plus hospitals.

Residential and nonresidential provisions are in separate chapters for easier use.

4.2.21 Senate Bill 97

Senate Bill 97 (SB 97) was enacted in 2007. SB 97 required Governor's Office of Planning and Research (OPR) to develop, and the Natural Resources Agency to adopt, amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. Those CEQA Guidelines amendments clarified several points, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects and must reach a conclusion regarding the significance of those emissions.
- When a project's GHG emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions.
- Lead agencies must analyze potentially significant impacts associated with placing projects in hazardous locations, including locations potentially affected by climate change.

- Lead agencies may significantly streamline the analysis of GHGs on a project level by using a programmatic GHG emissions reduction plan meeting certain criteria.
- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply and ways to reduce energy demand, including through the use of efficient transportation alternatives.

As part of the administrative rulemaking process, the California Natural Resources Agency developed a Final Statement of Reasons explaining the legal and factual bases, intent, and purpose of the CEQA Guidelines amendments. The amendments to the CEQA Guidelines implementing SB 97 became effective on March 18, 2010. SB 97 applies to any environmental impact report (EIR), negative declaration, mitigated negative declaration, or other document required by CEQA, which has not been finalized.

4.3 Regional

4.3.1 South Coast Air Quality Management District

4.3.1.1 AIR QUALITY

SCAQMD shares responsibility with CARB for ensuring that all state and federal ambient air quality standards are achieved and maintained throughout all of Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino Counties. The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, including all of Orange County and Los Angeles County, except for the Antelope Valley; the non-desert portion of western San Bernardino County; and the western and Coachella Valley portions of Riverside County. The Air Basin is a subregion of the SCAQMD jurisdiction.

To meet the CAAQS and NAAQS, the SCAQMD has adopted a series of AQMPs. The 2016 AQMP incorporates the SCAG 2016 Regional Transportation Plan/Sustainable Community Strategy (2016-2040 RTP/SCS)[3] and updated emission inventory methodologies for various source categories. The 2016 AQMP also includes the new federal requirements, implementation of new technology measures, and the continued development of economically sound, flexible compliance approaches.

The AQMP provides emissions inventories, ambient measurements, meteorological episodes, and air quality modeling tools. The AQMP also provides policies and measures to guide responsible agencies in achieving federal standards for healthful air quality in the Air Basin. It also incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources.

The SCAQMD adopts rules and regulations to implement portions of the AQMP. Several of these rules may apply to project construction or operation. For example, SCAQMD Rule 403 requires the implementation of best available fugitive dust control measures during active construction periods capable of generating fugitive dust emissions from on-site earthmoving activities, construction/demolition activities, and construction equipment travel on paved and unpaved roads.

The SCAQMD is currently in the process of replacing the CEQA Air Quality Handbook, approved in 1993, with the Air Quality Analysis Guidance Handbook (SCAQMD 2022a). In order to assist the CEQA

[3] Due to the AQMD publish date of 2016, the 2016 Regional Transportation Plan was incorporated. As discussed in the 2020-2045 RTP/SCS, the actions and strategies included in the 2020-2045 RTP/SCS remain unchanged from those adopted in the 2012-2035 and 2016-2040 RTP/SCS.

practitioner in conducting an air quality analysis in the interim while this replacement air quality analysis guidance handbook is being prepared, supplemental guidance/information is provided on the SCAQMD website and includes: 1) EMission FACtor (EMFAC) on-road vehicle emission factors; 2) background CO concentrations; 3) localized significance thresholds (LSTs); 4) mitigation measures and control efficiencies; 5) mobile source toxics analysis; 6) off-road mobile source emission factors; 7) $PM_{2.5}$ significance thresholds and calculation methodology; and 8) updated SCAQMD air quality significance thresholds (SCAQMD 2022a). The SCAQMD also recommends using approved models to calculate emissions from land use products projects, such as the California Emission Estimator Model (CalEEMod) Version 2022.1.1.17 (California Air Pollution Control Officers Association [CAPCOA] 2022). These recommendations were followed in the preparation of this analysis.

The SCAQMD has also adopted land use planning guidelines in the *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning* (SCAQMD 2005), which considers impacts to sensitive receptors from facilities that emit TAC emissions. SCAQMD's siting distance recommendations are the same as those provided by CARB. The SCAQMD document introduces land use–related policies that rely on design and distance parameters to minimize emissions and lower potential health risk.

SCAQMD's guidelines are voluntary initiatives recommended for consideration by local planning agencies. The following SCAQMD rules and regulations would be applicable to the project:

- SCAQMD Rule 403 required projects to incorporate fugitive dust control measures at least as effectively as the following measures:
  - Use water to control dust generation during demolition of structures;
  - Clean up mud and dirt carried onto paved streets from the site;
  - Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site;
  - All haul trucks would be covered or would maintain at least 6 inches of freeboard;
  - All material transported off-site shall be sufficiently watered or securely covered to prevent excessive amounts of spillage or dust;
  - Suspend earthmoving operations or additional watering would be implemented to meet Rule 403 criteria if wind gusts exceed 25 miles per hour;
  - The owner or contractor shall keep the construction area sufficiently dampened to control dust caused by construction and hauling, and at all times provide reasonable dust control of dust caused by wind. All paved demolition and construction areas shall be wetted at least twice daily during excavation and construction, and temporary dust cover shall be used to reduce dust emissions; and
  - An information sign shall be posted at the entrance to the construction site that identifies the permitted construction hours and provides a telephone number to call and receive information about the construction project or to report complaints regarding excessive fugitive dust generation. A construction relations officers shall be appointed to act as a community liaison concerning on-site activity, including investigation and resolution of issues related to fugitive dust generating.
- SCAQMD Rule 1113 limits the volatile organic compound content of architectural coating.
- SCAQMD Rule 1403 establishes survey requirements, notifications, and work practice requirements to prevent asbestos emissions from emanating during building renovation and demolition activities. Any activities at the project site that would renovate or modify the existing structures, including the proposed project, would be required to comply with this rule.

- SCAQMD Regulation XIII, New Source Review, requires new on-site facility nitrogen oxide emissions to be minimized through the use of emission control measures (e.g., use of best available technology control technology for new combustion sources such as boilers and water heaters).

SCAQMD has adopted two rules to limit cancer and non-cancer health risks from facilities located within its jurisdiction. Rule 1401 (New Source Review of Toxic Air Contaminants) regulates new or modified facilities, and Rule 1402 (Control of Toxic Air Contaminants from Existing Sources) regulates facilities that are already operating. Rule 1402 incorporates requirements of the AB 2588 program, including implementation of risk reduction plans for significant risk facilities.

4.3.1.2 GREENHOUSE GAS EMISSIONS

SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of chlorofluorocarbons, methyl chloroform, carbon tetrachloride, and halons by December 1995;
- Phase out the large-quantity use and corresponding emissions of hydrochlorofluorocarbons by the year 2000;
- Develop recycling regulations for hydrochlorofluorocarbons (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and
- Support the adoption of a California GHG emission reduction goal.

In 2008, SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds. Within its October 2008 document, SCAQMD proposed the use of a percent emission reduction target to determine significance for commercial/residential projects that emit greater than 3,000 $MTCO_2e$ per year. Under this proposal, commercial/residential projects that emit fewer than 3,000 $MTCO_2e$ per year would be assumed to have a less-than-significant impact on climate change. SCAQMD has yet to adopt a GHG significance threshold for land use development projects such as commercial and/or residential projects.

4.3.2 Southern California Association of Governments

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, the economy, community development, and the environment. SCAG coordinates with various air quality and transportation stakeholders in Southern California to ensure compliance with the federal and state air quality requirements, including applicable federal, state, and air district laws and regulations. As the federally designated Metropolitan Planning Organization for the six-county Southern California region, SCAG is required by law to ensure that transportation activities conform to, and are supportive of, the goals of regional and state air quality plans to attain the NAAOS. In addition, SCAG is a co-producer, with SCAQMD, of the transportation strategy and transportation control measure sections of the 2016 AQMP. The development of the 2016 AQMP relies on population and transportation growth projections contained in SCAG's 2016-2040 RTP/SCS.

On September 3, 2020, SCAG's Regional Council adopted an updated RTP/SCS known as the 2020-2045 RTP/SCS or connect SoCal. As with the 2016-2020 RTP/SCS, the purpose of the 2020-2045 RTP/SCS is

to meet the mobility needs of the six-county SCAG region over the subject planning period through a roadmap identifying sensible ways to expand transportation options, improve air quality, and bolster Southern California long-term economic viability. On October 30, 2020, the CARB accepted SCAG's determination that the SCS met the applicable state GHG emissions targets. The goals and policies of the 2020- 2045 RTP/SCS are similar to, and consistent with, those of the 2016-2040 RTP/SCS. In addition, CARB's new target requiring a 19% reduction in per-capita GHG emissions has been included in the 2020-2045 RTP/SCS, to fulfill SB 375 compliance with respect to meeting the State's GHG emission reduction goals.

4.4 County of Los Angeles

4.4.1 County of Los Angeles General Plan

The County Board of Supervisors adopted the County of Los Angeles 2035 General Plan (2035 General Plan) on October 6, 2015. The adopted County General Plan represents a compromise comprehensive update intended to reflect changing demographics, growth, and infrastructure conditions in the county. The County General Plan contains an Air Quality Element that addresses air quality and related issues. Included in the Air Quality Element are goals encouraging mixed-use development, the use of "green building" principles, energy and water efficiency, reducing vehicle miles traveled and vehicle trips, and promoting alternative modes of transportation.

The Air Quality Element of the County General Plan establishes the following goals that are relevant to the project:

- Goal AQ 1: Protection from exposure to harmful air pollutants
- Goal AQ 2: The reduction of air pollution and mobile source emissions through coordinated land use, transportation, and air quality planning.
- Goal AQ3: Implementation of plans and programs to address the impact of climate change.
  - Policy AQ 3.2 - Reduce energy consumption of County operations by 20% by 2015.
  - Policy AQ 3.3 - Reduce water consumption of County operations.
  - Policy AQ 3.5 - Encourage energy conservation in new development and municipal operations.
  - Policy AQ 3.6 - Support rooftop solar facilities on new and existing buildings.

The County has the authority and responsibility to reduce air pollution by assessing and mitigating air emissions resulting from its land use decisions. Consistent with CEQA, the County assesses the air quality impacts of new development projects and requires mitigation of potentially significant air quality impacts by applying required conditions to projects through the County approval process. Depending on the location, the County uses either SCAQMD's CEQA Air Quality Handbook and SCAQMD's supplemental online guidance/information or CEQA guidance from the Antelope Valley Air Quality Management District for the environmental review of plans and development proposals within its jurisdiction. These guidance documents are more specific than the 2035 General Plan goals and policies noted above. Implementation of these guidance documents and consistency with the thresholds contained therein generally ensures that development projects are supportive and consistent with the 2035 General Plan.

4.4.2 OurCounty – Los Angeles Countywide Sustainability Plan

OurCounty is a regional sustainability plan for the County of Los Angeles and was adopted by the Board of Supervisors on Tuesday, August 6, 2019. It outlines what local governments and stakeholders can do to enhance the well-being of every community in the county while reducing damage to the natural environment and adapting to the changing climate, particularly focusing on those communities that have been disproportionately burdened by environmental pollution. The plan envisions streets and parks that are accessible, safe, and welcoming to everyone; air, water, and soil that are clean and healthy; affordable housing that enables all residents to thrive in place; and a just economy that runs on renewable energy instead of fossil fuels. OurCounty is organized around 12 goals for a sustainable Los Angeles County:

- ***Goal 1.*** *Resilient and healthy community environments where residents thrive in place.* The County will protect low-income communities and communities of color from pollution, reduce health and economic inequities, and support more resilient and inclusive communities.
- ***Goal 2.*** *Buildings and infrastructure that support human health and resilience.* The buildings and infrastructure of both yesterday and tomorrow will use more efficient technologies and practices that reduce resource use, improve health, and increase resilience.
- ***Goal 3.*** *Equitable and sustainable land use and development without displacement.* With policy tools such as anti-displacement measures, existing community members can remain in and strengthen their neighborhoods and networks while accepting new residents through more compact, mixed-use development.
- ***Goal 4.*** *A prosperous LA County that provides opportunities for all residents and businesses and supports the transition to a green economy.* We will support the growth of green economy sectors through our procurement practices, land use authority, and various economic and workforce development incentives.
- ***Goal 5.*** *Thriving ecosystems, habitats, and biodiversity.* The region's ecosystems, habitats, and biodiversity are under stress from urbanization and climate change. Careful planning will ensure that our ecosystems, including urban habitats, thrive even as our region becomes increasingly urbanized.
- ***Goal 6.*** *Accessible parks, beaches, recreational waters, public lands, and public spaces that create opportunities for respite, recreation, ecological discovery, and cultural activities.* The County will help make parks and public lands more accessible and inclusive and will manage them carefully so that all residents may enjoy their benefits.
- ***Goal 7.*** *A fossil fuel-free LA County.* By supporting an efficient transition to a zero emission energy and transportation system, the County will be a leader in taking action to address the climate crisis.
- ***Goal 8.*** *A convenient, safe, clean, and affordable transportation system that enhances mobility while reducing car dependency.* By developing programs that focus on reducing the number of miles people travel in private vehicles, the County will help people choose alternatives to single-occupancy vehicles. These programs will expand residents' mobility, including those residents whose limited automobile access translates to stifled economic opportunity.
- ***Goal 9.*** *Sustainable production and consumption of resources.* The County will effectively manage our waste, water, energy, and material resources by improving our ability to promote integrative and collaborative solutions at the local and regional scale.

- ***Goal 10.*** *A sustainable and just food system that enhances access to affordable, local, and healthy food.* The County of Los Angeles will leverage its capital assets, public services, and regulatory authority to improve access to healthy food within County boundaries while optimizing its purchasing power and business services to make food production more sustainable.
- ***Goal 11.*** *Inclusive, transparent, and accountable governance that facilitates participation in sustainability efforts, especially by disempowered communities.* The County will act to create a more inclusive and accountable governance structure, in order to build stronger communities and better-informed policy and programs.
- ***Goal 12.*** *A commitment to realize OurCounty sustainability goals through creative, equitable, and coordinated funding and partnerships.* The County will seek to strengthen partnerships, establish new funding techniques, and leverage its own purchasing power to advance the goals of OurCounty.

4.5 City of Los Angeles

Although the project site is located within the city of Los Angeles, it is owned by the County of Los Angeles. Accordingly, the project is subject to the regulatory controls of the County of Los Angeles and not the City of Los Angeles. Nonetheless, consideration of the city-level regulatory framework fulfills the intended purpose of CEQA as disclosing all relevant information associated with the project.

4.5.1 City of Los Angeles General Plan

The Air Quality Element of the City General Plan was adopted on November 24, 1992, and sets forth the goals, objectives, and policies which guide the City of Los Angeles (City) in the implementation of its air quality improvement programs and strategies. The Air Quality Element acknowledges the interrelationships among transportation and land use planning in meeting the City's mobility and air quality goals. The Air Quality Element of the City General Plan establishes six goals:

- Goal 1: Good air quality in an environment of continued population growth and healthy economic structure;
  - Objective 1.1- It is the objective of the City of Los Angeles to reduce air pollutants consistent with the Regional Air Quality Management Plan (AQMP), increase traffic mobility, and sustain economic growth citywide.
  - Objective 1.3- It is the objective of the City of Los Angeles to reduce particulate air pollutants emanating from unpaved areas. parking lots, and construction sites.
    - Policy 1.3.1- Minimize particulate emissions from construction sites.
    - Policy 1.3.2- Minimize particulate emissions from unpaved roads and parking lots associated with vehicular traffic.
- Goal 2: Less reliance on single-occupant vehicles with fewer commute and non-work trips;
  - Objective 2.1- It is the objective of the City of Los Angeles to reduce work trips as a step toward attaining trip reduction objectives necessary to achieve regional air quality goals.
    - Policy 2.1.1- Utilize compressed work weeks and flextime, telecommuting, carpooling, vanpooling, public transit, and improve walking/bicycling–related facilities in order to reduce Vehicle Trips and/or Vehicle Miles Traveled (VMT) as an employer and encourage the private sector to do the same to reduce work trips and traffic congestion.
    - Policy 2.2.2- Encourage multi-occupant vehicle travel and discourage single-occupant vehicle travel by instituting parking management practices.

- Objective 4.1- It is the objective of the City of Los Angeles to include regional attainment of ambient air quality standards as a primary consideration in land use planning.
  - Policy 4.1.1- Coordinate with all appropriate regional agencies in the implementation of strategies for the integration of land use, transportation, and air quality policies.
- Objective 4.2- It is the objective of the City of Los Angeles to reduce vehicle trips and vehicle miles traveled associated with land use patterns.
  - Policy 4.2.2- Improve accessibility for the City's residents to places of employment, shopping centers, and other establishments.
  - Policy 4.2.3- Ensure that new development is compatible with pedestrians, bicycles, transit, and alternative fuel vehicles.
  - Policy 4.2.4- Require that air quality impacts be a consideration in the review and approval of all discretionary projects.
  - Policy 4.2.5- Emphasize trip reduction, alternative transit and congestion management measures for discretionary projects.

- Goal 3: Efficient management of transportation facilities and systems infrastructure using cost-effective system management and innovative demand-management techniques;
  - Objective 5.1- It is the objective of the City of Los Angeles to increase energy efficiency of City facilities and private developments.
    - Policy 5.1.2- Effect a reduction in energy consumption and shift to nonpolluting sources of energy in its buildings and operations.
    - Policy 5.1.2- Effect a reduction in energy consumption and shift to nonpolluting sources of energy in its buildings and operations.
    - Policy 5.1.4- Reduce energy consumption and associated air emissions by encouraging waste reduction and recycling.
  - Objective 5.3- It is the objective of the City of Los Angeles to reduce the use of polluting fuels in stationary sources.
    - Policy 5.3.1- Support the development and use of equipment powered by electric or low-emitting fuels.

- Goal 4: Minimal impacts of existing land use patterns and future land use development on air quality by addressing the relationship between land use, transportation, and air quality;
  - Objective 4.1- It is the objective of the City of Los Angeles to include regional attainment of ambient air quality standards as a primary consideration in land use planning.
    - Policy 4.1.1- Coordinate with all appropriate regional agencies in the implementation of strategies for the integration of land use, transportation, and air quality policies.
  - Objective 4.2- It is the objective of the City of Los Angeles to reduce vehicle trips and vehicle miles traveled associated with land use patterns.
    - Policy 4.2.2- Improve accessibility for the City's residents to places of employment, shopping centers, and other establishments.
    - Policy 4.2.3- Ensure that new development is compatible with pedestrians, bicycles, transit, and alternative fuel vehicles.
    - Policy 4.2.4- Require that air quality impacts be a consideration in the review and approval of all discretionary projects.
    - Policy 4.2.5 - Emphasize trip reduction, alternative transit and congestion management measures for discretionary projects.

- Goal 5: Energy efficiency through land use and transportation planning, the use of renewable resources and less-polluting fuels, and the implementation of conservative measures including passive measures such as site orientation and tree planting; and
- Goal 6: Citizens' awareness of the links between personal behavior and air pollution, and participation and efforts to reduce air pollution.

In accordance with CEQA requirements. the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation. The City uses SCAQMD's CEQA Air Quality Handbook and SCAQMD's supplemental online guidance/information for the environmental review of plans and development proposals within its jurisdiction.

4.5.2 City of Los Angeles Green LA Action Plan

The City of Los Angeles began addressing the issue of global climate change by publishing *Green LA, An Action Plan to Lead the Nation in Fighting Global Warming* ("LA Green Plan") in 2007. This document outlined the goals and actions the City has established to reduce the generation and emission of GHGs from both public and private activities. According to the LA Green Plan, the City is committed to the goal of reducing CO_2 emissions to 35% below 1990 levels by the year 2030. To achieve this, the City has been implementing the following:

- Increase the generation of renewable energy;
- Improve energy conservation and efficiency; and
- Change transportation and land use patterns to reduce dependence on automobiles.

4.5.3 City of Los Angeles Green New Deal/Sustainable City Plan

Rather than an adopted plan, the Sustainable City pLAn is a mayoral initiative released in 2015 that includes both short-term and long-term aspirations through the year 2035 in various topic areas, including: water, solar power, energy-efficient buildings, carbon and climate leadership, waste and landfills, housing and development, mobility and transit, and air quality, among others.

In 2019, the first 4-year update to the 2015 Sustainable City pLAn was released. While not a plan intended solely to reduce GHG emissions. this updated document, known as the City's Green New Deal, expands upon the City's vision for a sustainable future and provides accelerated targets and new goals, including climate mitigation. The Green New Deal has established targets such as 100% renewable energy by 2045, installation of 10,000 publicly available electric vehicle chargers by 2022 and 28,000 by 2028, diversion of 100% of waste by 2050, and recycling 100% of wastewater by 2035.

5 THRESHOLDS OF SIGNIFICANCE

5.1 Air Quality

Based upon the environmental checklist presented in Appendix G of the State CEQA Guidelines, the project would have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan (Impact AQ-1);

- Result in cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under applicable federal or state ambient air quality standards (Impact AQ-2);
- Expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3); or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (Impact AQ-4).

A discussion of applicable thresholds of significance and significance determination follow.

5.1.1 Construction

The SCAQMD has established significance thresholds based on the State CEQA significance criteria. Specifically, based on criteria set forth in the SCAQMD CEQA Handbook Air Quality Significance Thresholds, the project would have a significant impact with regard to construction emissions if any of the following would occur:

- Regional emissions from both direct and indirect sources would exceed any of the following SCAQMD-prescribed threshold levels: 1) 100 pounds per day for NO_X; 2) 75 pounds per day for VOCs; 3) 150 pounds per day for PM_{10} or sulfur oxides; 4) 55 pounds per day for $PM_{2.5}$; or 5) 550 pounds per day for CO.
- Maximum on-site daily localized emissions exceed the LST, resulting in predicted ambient concentrations in the vicinity of the project site greater than the most stringent ambient air quality standards for CO (20 parts per million [ppm] over a 1-hour period, or 9.0 ppm averaged over an 8-hour period) and NO_2 (0.18 ppm over a 1-hour period, 0.1 ppm over a 3-year average of the 98th percentile of the daily maximum 1-hour average, 0.03 ppm averaged over an annual period).
- Maximum on-site localized PM_{10} or $PM_{2.5}$ emissions during construction exceed the applicable LSTs, resulting in predicted ambient concentrations in the vicinity of the project site to exceed the incremental 24-hour threshold of 10.4 micrograms per cubic meter ($\mu g/m^3$) or 1.0 $\mu g/m^3$ PM_{10} averaged over an annual period.

5.1.2 Operations

Based on criteria set forth in the SCAQMD CEQA Handbook Air Quality Significance Thresholds, the project would have a significant impact with regard to project operations if any of the following would occur:

- Operational emissions exceed any of the following SCAQMD prescribed threshold levels: 1) 55 pounds per day for NO_X; 2) 55 pounds per day for VOCs; 3) 150 pounds per day for PM_{10} or sulfur oxides; 4) 55 pounds per day for $PM_{2.5}$; and 5) 550 pounds per day for CO.
- Maximum on-site daily localized emissions exceed the LST, resulting in predicted ambient concentrations in the vicinity of the project site greater than the most stringent ambient air quality standards for CO (20 ppm over a 1-hour period or 9.0 ppm averaged over an 8-hour period) and NO_2 (0.18 ppm over a 1-hour period, 0.1 ppm over a 3-year average of the 98th percentile of the daily maximum 1-hour average, 0.03 ppm averaged over an annual period).
- Maximum on-site localized operational PM_{10} or $PM_{2.5}$ emissions exceed the incremental 24-hour threshold of 2.5 $\mu g/m^3$ or 1.0 $\mu g/m^3$ PM_{10} averaged over an annual period.
- The project causes or contributes to an exceedance of the California 1-hour or 8-hour CO standards of 20 or 9.0 ppm, respectively.

- The project creates an odor nuisance pursuant to SCAQMD Rule 402.

5.1.3 Toxic Air Contaminants

The determination of significance shall be made on a case by case basis, considering the following factors:

- The regulatory framework for the toxic material(s) and process(es) involved;
- The proximity of the toxic air contaminants to sensitive receptors;
- The quantity, volume, and toxicity of the contaminants expected to be emitted;
- The likelihood and potential level of exposure; and
- The degree to which project design would reduce the risk of exposure.

Based on the criteria set forth in SCAQMD's CEQA Air Quality Handbook, the project may have a significant TAC impact if:

- The project results in the exposure of sensitive receptors to carcinogenic or toxic air contaminants that exceed the maximum incremental cancer risk of 10 in 1 million or an acute or chronic hazard index of 1.0. For projects with a maximum incremental cancer risk between 1 in 1 million and 10 in 1 million, a project would result in a significant impact if the cancer burden exceeds 0.5 excess cancer cases.

5.1.4 Consistency with Applicable Air Quality Plans

CEQA Guidelines Section 15125 requires an analysis of project consistency with applicable governmental plans and policies. In accordance with SCAQMD's CEQA Air Quality Handbook, the following criteria were used to evaluate the project's consistency with SCAQMD's AQMP and SCAG's regional plans and policies:

- Criterion 1: Will the project result in any of the following:
  - An increase in the frequency or severity of existing air quality violations;
  - Cause or contribute to new air quality violations; or
  - Delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP?
- Criterion 2: Will the project exceed the assumptions utilized in preparing the AQMP?
  - Is the project consistent with the population and employment growth projections upon which AOMP forecasted emission levels are based;
  - Does the project include air quality mitigation measures; or
  - To what extent is the project development consistent with AQMP control measures?

As previously noted, the County assesses the air quality impacts of new development projects and requires mitigation of potentially significant air quality impacts by applying required conditions to projects through the County approval process in accordance with the SCAQMD's CEQA Air Quality Handbook (SCAQMD 2022a). This guidance document is more specific than the 2035 General Plan goals and policies as well as the Air Quality Element of the City General Plan. Ensuring consistency with the SCAQMD's CEQA Air Quality Handbook and AQMP control measures would ensure that the project supports and is consistent with the air quality goals and policies contained in the 2035 General Plan and the City General Plan.

5.1.5 Cumulative Impacts

Based on SCAQMD guidance, individual construction projects that exceed the SCAQMD's recommended daily thresholds for project-specific impacts would also cause a cumulatively considerable increase in emissions for those pollutants for which the Air Basin is in non-attainment. As discussed in the SCAQMD's White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution (2003a):

> As Lead Agency, the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. … Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant (SCAQMD 2003b:D-3).

The cumulative analysis of air quality impacts within this analysis follows SCAQMD's guidance such that construction or operational project emissions will be considered cumulatively considerable if project-specific emissions exceed an applicable SCAQMD-recommended daily threshold.

5.1.6 Localized Significance Thresholds

The assessment of the project's potential to expose sensitive receptors to substantial pollutant concentrations (Threshold AQ-3) includes an LST analysis, as recommended by the SCAQMD, to evaluate the potential of localized air quality impacts to sensitive receptors in the immediate vicinity of the project; a CO hot spot assessment; and construction and operation HRA analyses. For project sites of 5 acres or less, the SCAQMD LST Methodology (SCAQMD 2009) includes lookup tables that can be used to determine the maximum allowable daily emissions that would satisfy the localized significance criteria (i.e., the emissions would not cause an exceedance of the applicable concentration limits for NO_2, CO, PM_{10}, and $PM_{2.5}$) without performing project-specific dispersion modeling. Although the proposed development area of the project site is greater than 5 acres (estimated to be 13 acres), the project would disturb less than 5 acres in 1 day, as discussed in detail in the following text, so it is appropriate to use the lookup tables for the LST evaluation.

The LSTs for NO_2 and CO represent the allowable increase in concentrations above background levels in the vicinity of a project that would not cause or contribute to an exceedance of the relevant ambient air quality standards, while the threshold for PM_{10} represents compliance with Rule 403 (Fugitive Dust). The LST for $PM_{2.5}$ is intended to ensure that construction emissions do not contribute substantially to existing exceedances of the $PM_{2.5}$ ambient air quality standards. The allowable emission rates depend on the following parameters:

- Source-receptor area (SRA) in which the project is located
- Size of the project site
- Distance between the project site and the nearest sensitive receptor (e.g., residences, schools, hospitals)

The project site is located in SRA 1 (Central Los Angeles County). The SCAQMD provides guidance for applying CalEEMod to the LSTs. LST pollutant screening level concentration data are currently published for 1-, 2-, and 5-acre sites for varying distances. The maximum number of acres disturbed on the peak day was estimated using the *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds* (SCAQMD 2011), which provides estimated acres per 8-hour day for crawler tractors, graders, rubber-tired dozers, and scrapers. Based on the SCAQMD guidance, and assuming an excavator

can grade 0.5 acre per 8-hour day (similar to graders, dozers, and tractors), it was estimated that the maximum daily area on the project site that would be disturbed by off-road equipment would be 4.5 acres per day (five rubber-tired dozers and four tractor/loader/backhoe operating during the demolition and site preparation phases).

The nearest sensitive-receptor land use (a residence) is located approximately 87 feet north and east of the project's limits of construction. Therefore, the LST receptor distance was assumed to be 87 feet (26.5 meters). The LST values from the SCAQMD lookup tables for SRA for a 5-acre project site and a receptor distance of 25 meters (82 feet) are shown below in Table 6.

Table 6. Localized Significance Thresholds for SRA 1 (Central Los Angeles County)

Pollutant	Threshold (pounds per day)
NO_2	161
CO	1,861
PM_{10} (Operations)	4
PM_{10} (Construction)	16
$PM_{2.5}$ (Operations)	2
$PM_{2.5}$ (Construction)	8

Source: SCAQMD (2009)
Note: LST thresholds determined based on the values for 5-acre site at a distance of 25 meters (82 feet) from the nearest sensitive receptor.

The construction and operational HRA methodology and assumptions are presented in Section 6.4.1 and 6.4.2, respectively. The HRA analyses apply the SCAQMD risk thresholds, which are a maximum incremental cancer risk greater than or equal to 10 in 1 million and a chronic hazard index greater than or equal to 1.0 (project increment). The CO hot spot assessment and operation HRA are evaluated under the potential for the project to expose sensitive receptors to substantial pollutant concentrations (Threshold AQ-3), along with the LST analysis.

The potential for the project to result in an odor impact (Threshold AQ-4) is based on the project's land use type and operational activity, and the potential for the project to create an odor nuisance pursuant to SCAQMD Rule 402.

5.2 Greenhouse Gases

Consistent with Appendix G of the State CEQA Guidelines, a project would have a significant GHG impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have an adverse effect on the environment (Impact GHG-1); or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs (Impact GHG-2).

State CEQA Guidelines Section 15064.4 recommends that lead agencies quantify GHG emissions projects and consider several other factors that may be used in the determination of significance of project-related GHG emissions, including: the extent to which the project may increase or reduce GHG emissions; whether the project exceeds an applicable significant threshold; and the extent to which the project complies with the regulations or requirements adopted to implement a reduction or mitigation of GHG.

Section 15064.4 does not establish a threshold of significance. Lead agencies have the discretion to establish significance thresholds for their respective jurisdictions, and in establishing those thresholds, a lead agency may appropriately look at thresholds developed by other public agencies, or suggested by other experts, such as the CAPCOA, as long as any threshold chosen is supported by substantial evidence (see State CEQA Guidelines Section 15064.7(c)). The State CEQA Guidelines also clarify that the events of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see State CEQA Guidelines Section 15130(f)). It is noted that the State CEQA Guidelines were amended in response to SB 97. In particular, the State CEQA Guidelines were amended to specify that compliance with the GHG emissions reduction plan renders a cumulative impact less than significant.

Per State CEQA Guidelines Section 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project. To qualify, such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs include "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plans [and] plans or regulations for the reduction of greenhouse gas emissions" (14 CCR Section 15064(h)(3)). Put another way, State CEQA Guidelines Section 15064(h)(3) allows a lead agency to make a finding of less than significant for GHG emissions if a project complies with adopted programs, plans, policies, and/or other regulatory strategies to reduce GHG emissions.

For example, the San Joaquin Valley Air Pollution Control District (SJVAPCD), CEQA Determinations of Significance tor Projects Subject to ARB's GHG cap-and-trade Regulation, APR- 2030 (June 25, 2014), "determined that GHG emissions increases that are covered under ARB's cap-and-trade regulation cannot constitute significant increases under CEQA..." Further, the SCAQMD has taken this position in CEQA documents it has produced as a Lead Agency. The SCAQMD has prepared three Negative Declarations and one Draft Environmental Impact Report that demonstrate the SCAQMD has applied its 10,000 $MTCO_2e$ per year significance threshold in such a way that GHG emissions covered by the cap-and-trade program do not constitute emissions that must be measured against the threshold.

Although GHG emissions can be quantified, CARB, SCAQMD, and the County have not adopted quantitative project-level significance thresholds for GHG emissions that would be applicable to the project. The OPR released a Discussion Draft: CEQA and Climate Change Advisory in December 2018 to provide updates and regulatory changes to a prior 2008 climate change advisory. The discussion draft addresses project-level analyses of GHG impacts and recognizes, "lead agency discretion in determining the appropriate methodologies, thresholds, and if necessary, mitigation measures" (OPR 2018:2).

Furthermore, the discussion draft explains that significance thresholds may be based on efficiency metrics, compliance with state goals and percentage reduction from Business-as-Usual emissions, consistency with relevant regulations, plans, policies, and regulatory programs, or an absolute numerical/quantitative threshold (OPR 2018). Per State CEQA Guidelines Section 15064.4(b), "in determining the significance of a project's greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions." When determining the significance of GHG impacts, lead agencies should consider the project's impact as compared to the existing environmental setting, whether the project exceeds a threshold of significance, and compliance with relevant GHG-related plans (see, for example, State CEQA Guidelines Section 15064.4(b)). Regarding the latter criterion, lead agencies should consider "the extent to which the project complies with

regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions (see, for example, State CEQA Guidelines Section 15183.5(b)). Per State CEQA Guidelines Section 15064.4(b)(3), such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions.

For the project, Los Angeles County, as the Lead Agency, has selected a 3,000 $MTCO_2e$ per year quantitative threshold to evaluate significance for GHG emissions. This is the interim GHG screening-level significance threshold. SCAQMD recommended this interim GHG screening-level threshold for projects that are in residential and commercial sectors[4] (SCAQMD 2008b). It is important to note that the GHG threshold of 3,000 $MTCO_2e$ per year is based on an interim threshold developed in 2008 to address the State's year 2020 and 2050 GHG reduction goals established under AB 32, which does not address the State's more recent GHG-reduction target of achieving carbon neutrality by 2045, per Executive Order B-55-18 (2018).

To achieve carbon neutrality by 2045, it is recommended that future development include measures to support building decarbonization, including the replacement of natural gas service with other alternatives, such as use of electrically-powered equipment (CARB 2022b; CEC 2021). Based on recent GHG threshold updates and supportive documentation prepared by the Bay Area Air Quality Management District (BAAQMD) and Sacramento Metropolitan Air Quality Management District (SMAQMD), it is recommended that future development prohibit the installation of natural gas infrastructure/use of natural gas–fired appliances, to the maximum extent possible, and incorporate electric-vehicle charging stations beyond what is required by current building standards in order to contribute its "fair share" of what would be required for the State to achieve its carbon neutrality goal (BAAQMD 2022; SMAQMD 2020). As a result, in addition to the GHG threshold of 3,000 $MTCO_2e$/year noted above, project-generated GHG emissions would also be considered to have a potentially significant impact if the project would not prohibit the installation of natural gas–fired appliances/equipment, to the maximum extent possible, or prohibit the installation of electric-vehicle charging stations beyond what is required by current building standards. As an additional significance criterion, consistency with the applicable plans and policies to reduce GHG emissions, including the emissions reduction policies, strategies, and measures discussed within CARB's Climate Change Scoping Plan, SCAG's 2020-2045 RTP/SCS, and the County of Los Angeles General Plan, was additionally evaluated.

6 METHODOLOGY

This analysis focuses on the potential change in the air quality environment due to implementation of the project. Air pollution emissions would result from both construction and operation of the project. Specific methodologies used to evaluate these emissions are discussed below.

The analysis is based on project specifics and default values in the latest versions of CalEEMod. Accordingly, this analysis has been conducted with the most recent available tools prepared and accepted by the regulatory agencies. The project phases have been grouped into six CalEEMod phases, based on the types of equipment and workload: 1) demolition; 2) site preparation; 3) grading; 4) building construction; 5) paving; and 6) architectural coating.

[4] While the La Brea Tar Pits Master Plan contemplates development that is not considered residential or commercial, the construction and operational attributes of the project (e.g., energy demand, water demand, offroad and stationary sources) are like that of development in the residential and commercial sectors. GHG emissions of residential, commercial, and museum facilities are similar in they are focused on mobile sources, energy sources, and off-road and stationary sources. Also, approaches to reducing GHGs will be similar for all these land use types and will center around efficiency improvements of the buildings, efficiency improvements of equipment, and switching to energy sources with lower GHG emissions.

The 13-acre project site has been divided into the following land uses for purposes of CalEEMod: 1) parking; 2) other non-asphalt surfaces; 3) educational library; and 4) recreational city park. This analysis includes quantification of construction and operation off-road equipment, fugitive dust, and on-road mobile sources.

6.1 Construction Emissions

The SCAQMD published the CEQA Air Quality Handbook in November 1993 to assist lead agencies, as well as consultants, project proponents, and other interested parties, in evaluating potential air quality impacts of projects in the Air Basin. The CEQA Air Quality Handbook provides standards, methodologies, and procedures for conducting air quality analysis and was used extensively in the preparation of this analysis. SCAQMD is currently in the process of replacing the CEQA Air Quality Handbook with the Air Quality Analysis Guidance Handbook.

In order to assist the CEQA practitioner in conducting an air quality analysis in the interim while the replacement Air Quality Analysis Guidance Handbook is being prepared, supplemental guidance/information is provided on the SCAQMD website and includes: 1) EMFAC on-road vehicles emission factors; 2) background CO concentrations; 3) localized significance thresholds (LSTs); 4) mitigation measures and control efficiencies; 5) mobile source toxics analysis; 6) off-road mobile source emission factors; and 7) updated SCAQMD Air Quality Significance Thresholds. SCAQMD also recommends using approved models to calculate emission from land use projects, such as the CalEEMod. These recommendations were followed in the preparation of this analysis.

6.1.1 Regional Emissions

The project's "regional" emission refers to emissions that will be evaluated based on regional significance thresholds established by SCAQMD, as discussed above. Daily regional emissions during construction are estimated by assuming a conservative construction schedule and applying the multiple source and fugitive dust emission factors derived from the SCAQMD-recommended CalEEMod latest version. Details of the modeling assumptions and emission factors are provided in Appendix A. The calculations of the emissions generated during project construction activities reflect the types and quantities of construction equipment that would be used to remove existing structures, grade and excavate the project site, construct the proposed buildings and related improvements, and plant new landscaping within the site.

6.1.2 Localized Emissions

The localized effects from the on-site portion of the daily emissions were evaluated and sensitive receptor locations potentially impacted by the project according to SCAQMD LST methodology, which uses on-site mass emission rate lookup tables and project-specific modeling, where appropriate. SCAQMD provides LSTs applicable to the following criteria pollutants: NO_x, CO, PM_{10}, and $PM_{2.5}$. SCAQMD does not provide an LST for SO_2 since land use development projects typically result in negligible construction and long-term operation emissions of this pollutant. Since VOCs are not a criteria pollutant, there are no ambient standard or SCAQMD LSTs for VOCs. Due to the role VOCs play in O_3 formation, it is classified as a precursor, and only a regional emissions threshold has been established.

LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard and/or were developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor. The mass rate lookup tables were developed for each source receptor area and can be used to determine whether or not a project may generate significant adverse

localized air quality impacts. SCAQMD provides LST mass rate lookup tables for projects with active construction areas that are less than or equal to 5 acres. For projects that exceed 5 acres—such as this project, which involves a 13-acre project site—the 5-acre LST lookup values can be used as a screening tool to determine which pollutants require detailed analysis. This approach is conservative as it assumes that all on-site emissions would occur within a 5-acre area and would over-predict potential localized impacts (i.e., more pollutant emissions occur within a smaller area, resulting in greater concentrations). If the project exceeds the LST lookup values, then SCAQMD recommends that project-specific air quality modeling must be performed to determine if the project's local emissions exceed applicable significance thresholds.

6.1.3 Construction Assumptions

Construction emissions associated with the project, including emissions associated with the operation of off-road equipment, haul-truck trips, on-road worker vehicle trips, vehicle travel on paved and unpaved surfaces, and fugitive dust from material handling activities, were calculated using CalEEMod version 2022.1.1.17 (CAPCOA 2022). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operation of a variety of land use projects. The model uses widely accepted federal and state models for emission estimates and default data from sources such as EPA AP-42 emission factors, CARB vehicle emission models, and studies from California agencies such as CEC. The model quantifies direct emissions from construction and operations, as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The model was developed in collaboration with the air districts in California. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions.

Emissions modeling included emissions generated during the following project phases: 1) demolition and site preparation of the project site; 2) installation of infrastructure improvements; 3) development of the proposed new museum building and parking lot; 4) landscaping and hydroseeding; and 5) on-site roadway improvements. These project phases have been grouped into six phases in CalEEMod based on the types of equipment and workload: 1) demolition; 2) site preparation; 3) grading; 4) building construction; 5) paving; and 6) architectural coating.

The 13-acre project site has been divided into the following land uses for purposes of CalEEMod: 1) parking (1.86 acres); 2) other non-asphalt surfaces (3.21 acres); 3) educational-library (64,000 square feet [1.47 acres], 40,000 square feet [0.92 acre], and 2,000 square feet [0.05 acre]); and 4) recreational city park (6 acres).

Modeling input data were based on this anticipated construction schedule and phasing. Construction equipment and usage required for each phase were obtained using CalEEMod defaults for the land use types which make up the project site, information provided by the Foundation, and default parameters contained in the model for the project site (Los Angeles County South Coast). The construction duration is assumed to be approximately 4 years. Project construction would consist of different activities undertaken in phases, through to the operation of the project. Typical construction equipment would be used during all phases of project construction and would be stored within the staging area, potentially including excavators, dozers, backhoes, dump trucks, water trucks, jackhammers, sand blasters, rollers, pavers, generators, scrapers, forklifts, delivery trucks, paving equipment, cranes, and air compressors. There is no blasting anticipated during construction. Construction assumes 53,000 cubic yards of cut/export and 37,000 cubic yards of imported fill, occurring during the grading and building construction phases. Table 7 shows the project's anticipated construction schedule, presents an estimate of the

maximum number of pieces of equipment for each construction phase, and conservatively assumes equipment would be operating 8 hours per day, 6 days per week for the construction phase duration.

Table 7. Construction Anticipated Schedule, Trips, and Equipment

Phase (Duration)	Equipment Used			Daily Vehicle Trips
	Type	Number	Hours per Day	
Demolition	Rubber-tired dozer	2	8	50 worker one-way trips 8 vendor one-way trips 4 haul one-way trips
(262 working days)	Excavator	3	7	
1/1/2024 – 10/31/2024 Approximately 102,000 square feet demolished	Concrete/Industrial saw	1	8	
Site Preparation	Rubber-tired dozers	3	7	20 worker one-way trips
(262 working days)	Tractors/Loaders/Backhoe	4	7	
1/1/2024 – 10/31/2024				
Grading	Graders	1	8	75 worker one-way trips 10 vendor one-way trips 107 haul one-way trips
(52 working days)	Excavators	2	8	
11/1/2024 – 12/31/2024	Tractors/Loaders/Backhoe	2	8	
	Scrapers	2	8	
	Rubber-tired dozers	1	8	
Building Construction	Forklifts	3	7	200 worker one-way trips 17 vendor one-way trips 7 haul one-way trips
(808 working days)	Generator sets	1	8	
1/25/2025 – 7/31/2027	Cranes	1	8	
	Welders	1	8	
	Tractors/Loaders/Backhoe	3	8	
Paving	Pavers	2	7	15 worker one-way trips
(184 working days)	Paving equipment	2	7	
6/1/2027 – 12/31/2027	Rollers	2	8	
Architectural Coating	Air compressor	1	6	20 worker one-way trips
(79 working days)				
7/1/2026 – 9/30/2026				

Notes: For the parameters that are not provided in the table (e.g., equipment horsepower and load factor, on-road trip lengths), CalEEMod defaults were used.

The construction particulate matter emissions were mitigated in the CalEEMod model to comply with the above SCAQMD measures discussed in Section 4.3 of this report. During construction, exposed areas and active demolition sites would be watered two times per day, and travel on unpaved roads or surfaces by workers, vendors, or haul trucks would be limited to a speed limit of 25 miles per hour. As an additional mitigation measure, all off-road equipment over 75 horsepower would be Tier 4 Interim (see Section 7.2), which differs from the CalEEMod average default.

6.2 Operational Emissions

6.2.1 Regional Emissions

Criteria pollutant and GHG emissions from the operational phase of the project were estimated using CalEEMod Version 2022.1.1.17 (CAPCOA 2022). Year 2028 was assumed as the first full year of operations after completion of construction. The operational emissions were calculated based on CalEEMod defaults associated with the project's land use types. Analysis of the project's likely impact on regional air quality during project operation takes into consideration five types of sources: 1) area, 2) energy, 3) mobile, 4) off-road, and 5) stationary.

6.2.1.1 AREA SOURCES

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating, water heating, and stoves are calculated as part of building energy use in CalEEMod. The project would not include woodstoves or fireplaces (wood or natural gas). Therefore, area source emissions associated with hearths were not included.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2022). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of residential and nonresidential buildings and on the default factor of pounds of VOC per building square foot per day. For parking lot land uses, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on a square footage of parking surface area and pounds of VOC per square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings, such as in paints and primers using during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of residential and nonresidential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings, and SCAQMD's Rule 1113 (Architectural Coatings) governs the VOC content for interior and exterior coatings. The model default reapplication rate of 10% of area per year is assumed. Architectural coating for the parking surface area was also estimated with CalEEMod defaults.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. For Los Angeles County, the average annual "summer" days are estimated to 365 days; however, it is assumed that landscaping equipment would likely only operate during the week (not weekends), so operational days were assumed to be 250 days per year in CalEEMod. Emissions associated with potential landscape maintenance equipment were included and no emission reduction features related to electric landscape equipment were assumed, to conservatively capture potential project operational emission sources.

6.2.1.2 ENERGY SOURCES

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage (non-hearth). Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off-site.

6.2.1.3 MOBILE SOURCES

The project would generate criteria pollutant emissions from mobile sources (vehicular traffic) as a result of project operations. Emissions from mobile sources during operation of the project were estimated using CalEEMod default trip rates, trip lengths, fleet mix, and emissions factors for each vehicle.

6.2.1.4 OFF-ROAD AND STATIONARY SOURCES

Three emergency generators and one forklift are included as part of the project operations and are calculated using CalEEMod defaults and estimated operating hours per year.

6.2.2 Localized Emissions

Localized impacts from project operations include calculation of on-site emission using SCAQMD's recommended CalEEMod and evaluation of these emissions consistent with SCAQMD's LST methodology (discussed above).

6.3 Greenhouse Gas

This analysis quantifies the project's total annual GHG emissions from construction and operation, taking into account the GHG emission reduction measures that would be incorporated into the project's design. However, given the lack of a formally adopted numerical significance threshold or a formally adopted local plan for reducing GHG emission applicable to this project, this analysis evaluates the significance of the project's GHG emission by assessing the project's consistency with regulatory schemes and policies that are designed to reduce GHG emission by encouraging development located and designed to result in the efficient use of resources.

While project design features would reduce project-related GHG emissions, not all measures are accounted for in the project's emissions inventory. Certain measures may not be accurately quantified or insufficient data are available to determine the reduction in GHG emissions.

The following project design features and mitigation measures are proposed with regard to GHG operation emissions:

- Incorporate energy-saving technologies and components to reduce the project's electrical use profile.
- Incorporate water-saving technologies and components to reduce the project's water/electrical use profile.
- Implement a Transportation Demand Management program, developed in consultation with Los Angeles Department of Transportation (LADOT).

6.4 Toxic Air Contaminants Impacts (Construction and Operations)

SCAQMD has also adopted land use planning guidelines in the *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning* (SCAQMD 2005), which considers impacts to sensitive receptors from facilities that emit TAC emissions. SCAQMD siting distance recommendations are the same as those provided by CARB. SCAQMD's document introduces land use–related policies that rely on design and distance parameters to minimize emissions and lower potential health risk. SCAQMD guidelines are voluntary initiatives recommended for consideration by local planning agencies.

Potential TAC impacts are evaluated by conducting a qualitative analysis consistent with the CARB Handbook (2005) followed by a more detailed analysis (i.e., dispersion modeling), as necessary. The qualitative analysis consists of reviewing the project to identify any new or modified TAC emission sources. If the qualitative evaluation does not rule out significant impacts from a new source, or modification of an existing TAC emissions source, a more detailed analysis is conducted. For the detailed analysis, sensitive receptor's locations are identified, and site-specific dispersion modeling is conducted to estimate project impacts.

Although the proposed development area of the project site is greater than 5 acres (estimated to be 13 acres), using the *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds* (SCAQMD 2011), the project would disturb less than 5 acres in 1 day. The LST lookup tables were used for project construction and operation and determined no significant impacts. However, due to the project acreage and the potential modification of the TAC (DPM) emitted on-site and off-site from on-road and off-road vehicles, health risk assessments were conducted for both construction and operations DPM; these are discussed in more detail below.

6.4.1 Construction Health Risk Assessment

An HRA was performed to evaluate potential health risks associated with construction of the project. The following discussion summarizes the dispersion modeling and HRA methodology; supporting construction HRA documentation, including detailed assumptions, is presented in Appendix B. For risk assessment purposes, PM_{10} in diesel exhaust is considered DPM, originating mainly from off-road equipment operating at a defined location for a given length of time at a given distance from sensitive receptors. Less-intensive, more-dispersed emissions result from on-road vehicle exhaust (e.g., heavy-duty diesel trucks). For the construction HRA, the CalEEMod scenario for the project was adjusted to reduce diesel truck one-way trip distances to approximately 1,760 feet, to estimate emissions from truck pass-by at proximate receptors.

The air dispersion modeling methodology was based on SCAQMD's generally accepted modeling practices (SCAQMD 2006). Air dispersion modeling was performed using the EPA's American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) Version 21112 modeling system (computer software) with the Lakes Environmental Software implementation/user interface, AERMOD View Version 10.2.1. The HRA followed the Office of Environmental Health Hazard Assessment 2015 guidelines (OEHHA 2015) and SCAQMD guidance to calculate the health risk impacts at all proximate receptors, as further discussed below. The dispersion modeling included the use of standard regulatory default options. AERMOD parameters were selected consistent with the SCAQMD and EPA guidance and identified as representative of the project site and project activities.

Cancer risk is defined as the increase in probability (chance) of an individual developing cancer due to exposure to a carcinogenic compound, typically expressed as the increased chances in 1 million. Maximum Individual Cancer Risk is the estimated probability of a maximally exposed individual

potentially contracting cancer because of exposure to TACs over a period of 30 years for residential receptor locations. For the construction HRA, the TAC exposure period was assumed to be from third trimester to 4 years for all receptor locations (i.e., the assumed duration of project construction). The exposure pathway for DPM is inhalation only.

The SCAQMD has also established noncarcinogenic risk parameters for use in HRAs, since some TACs increase noncancer health risk due to long-term (chronic) exposures and some TACs increase noncancer health risk due to short-term (acute) exposures. No short-term, acute relative exposure level has been established for DPM; therefore, acute impacts of DPM are not addressed in the HRA. Chronic exposure is evaluated in the construction HRA. Noncarcinogenic risks are quantified by calculating a hazard index, expressed as the ratio between the ambient pollutant concentration and its toxicity or Reference Exposure Level which is a concentration at or below which health effects are not likely to occur. The chronic hazard index is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system. A hazard index of less than one (1.0) means that adverse health effects are not expected.

6.4.2 Operational Health Risk Assessment

An HRA was performed to evaluate potential health risk associated with operation of the project, specifically from trucks traveling to and from the project site and off-road or stationary equipment within the project site. The following discussion summarizes the dispersion modeling and HRA methodology; supporting operational HRA documentation, including detailed assumptions, is presented in Appendix B. For risk assessment purposes, PM_{10} in diesel exhaust is considered DPM, originating mainly from diesel trucks traveling off-site, and on-site off-road and stationary equipment.

Like the construction scenario, air dispersion modeling methodology was based on SCAQMD's generally accepted modeling practices (SCAQMD 2018). Air dispersion modeling was performed using the EPA's AERMOD Version 21112 modeling system (computer software) with the Lakes Environmental Software implementation/user interface, AERMOD View Version 10.2.1. The HRA followed OEHHA 2015 guidelines (OEHHA 2015) and SCAQMD guidance to calculate the health risk impacts at all proximate receptors, as further discussed below. The dispersion modeling included the use of standard regulatory default options. AERMOD parameters were selected consistent with the SCAQMD and EPA guidance and identified as representative of the project site and project activities. The ground-level concentration plot files were used to estimate the long-term cancer health risk to an individual, and the noncancer chronic health indices.

Cancer risk is defined as the increase in probability (chance) of an individual developing cancer due to exposure to a carcinogenic compound, typically expressed as the increased chances in 1 million. Maximum Individual Cancer Risk is the estimated probability of a maximally exposed individual potentially contracting cancer as a result of exposure to TACs over a period of 30 years, operational lifetime, for residential receptor locations. For the operational HRA, the TAC exposure period was assumed to be from third trimester to 30 years for all receptor locations. The mandatory exposure pathways were selected.

The SCAQMD has also established noncarcinogenic risk parameters for use in HRAs, since some TACs increase noncancer health risk due to long-term (chronic) exposures and some TACs increase noncancer health risk due to short-term (acute) exposures; however, no short-term, acute relative exposure values are established and regulated for DPM and therefore are not addressed in this assessment. Noncarcinogenic risks are quantified by calculating a hazard index, expressed as the ratio between the ambient pollutant concentration and its toxicity or Reference Exposure Level, which is a concentration at or below which health effects are not likely to occur. The chronic hazard index is the sum of the individual substance

chronic hazard indices for all TACs affecting the same target organ system. A hazard index of less than one (1.0) means that adverse health effects are not expected.

If the cancer risk from project operation at the maximally exposed individual resident exceeds 1 in 1 million, cancer burden, for which a SCAQMD significance threshold of 0.5, is evaluated. Unlike cancer risk, which is the lifetime probability (chances) of an individual developing cancer due to exposure to a carcinogenic compound, cancer burden estimates the number of theoretical cancer cases in a defined population resulting from a lifetime exposure to carcinogenic TACs. As described in the OEHHA guidance manual: The cancer burden can be calculated by multiplying the cancer risk at a census block centroid by the number of people who live in the census block, and adding up the estimated number of potential cancer cases across the zone of impact. The result of this calculation is a single number that is intended to estimate of the number of potential cancer cases within the population that was exposed to the emissions for a lifetime (70 years) (OEHHA 2015).

7 IMPACT ANALYSIS

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.

Impact AQ-1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact with Mitigation. Section 15125 of the State CEQA Guidelines requires analysis of the project's consistency with the applicable government plans and policies. In accordance with the SCAQMD's CEQA Air Quality Handbook, the following criteria were used to evaluate the project's consistency with SCAQMD and SCAG regional plans and policies, including the AQMP:

- Will the project result in any of the following:
  - an increase in the frequency or severity of existing air quality violations;
  - cause or contribute to new air quality violations; or
  - delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP?
- Will the project exceed the assumptions used in preparing the AQMP?
  - Is the project consistent with the population and employment growth projections upon which AQMP forecasted emission levels are based; or
  - does the project include air quality mitigation measures; or
  - to what extent is project development consistent with the AQMP land use policies?

AQMP Air Quality Standards

With respect to the first criterion, localized concentrations of NO_2 as NO_X, CO, PM_{10}, and $PM_{2.5}$ have been analyzed for the project and are discussed further below. SO_2 emissions would be far below the SCAQMD daily significance thresholds during construction and long-term operations (see Impact AQ-2), and therefore would not have the potential to cause or contribute to a violation of the SO_2 ambient air quality standard. Because VOCs are not a criteria air pollutant, there is no ambient standard or localized threshold for VOCs. Because of the role VOCs play in O_3 formation, it is classified as a precursor pollutant and only a regional emissions threshold has been established.

Particulate matter is the primary pollutant of concern during construction activities, and therefore, the project's PM_{10} and $PM_{2.5}$ emissions during construction were analyzed: 1) to ascertain potential effects on localized concentrations; and 2) to determine if there is a potential for such emissions to cause or contribute to a violation of the ambient air quality standards for PM_{10} and $PM_{2.5}$.

Additionally, the project's maximum potential NO_X and CO daily emissions during construction and operations were analyzed to determine if there is a potential for project emissions to cause or contribute to a violation of an applicable ambient air quality standard. As shown in Table 8, Table 9, and Table 10, the analyzed pollutants would not exceed the regional SCAQMD thresholds of significance during construction or operation. As shown in Table 11 and Table 12, the analyzed pollutants would not exceed the localized SCAQMD-recommended LSTs during construction or operations. Therefore, project construction and operations would not result in a significant impact with regard to inconsistency with the applicable air quality plan regarding localized air quality. The project would not increase the frequency or severity of an existing violation or cause or contribute to new violations for any pollutants. As the project would not exceed any of the state and federal standards, the project would also not delay timely attainment of air quality standards or interim emission reductions specified in the AQMP.

Because the project would not introduce any substantial stationary sources of emissions, CO is the preferred benchmark pollutant for assessing local area air quality impacts from post-construction motor vehicle operations. As indicated above, no intersections would require a CO hot spot analysis, and impacts would be less than significant. Therefore, the project would not increase the frequency or severity of an existing CO violation or cause or contribute to new CO violations.

AQMP Assumptions

With respect to the second criterion for determining consistency with SCAQMD and SCAG air quality policies, the projections in the AQMP for achieving air quality goals are based on the assumptions in SCAG's 2020-2045 RTP/SCS regarding population, housing, and growth trends. Thus, the SCAQMD's second criterion for determining project consistency focuses on whether or not the project exceeds the assumptions used in preparing the forecast presented in the AQMD. Determining whether or not a project exceeds the assumptions reflected in the AQMP involves the evaluation of three criteria: 1) consistency with applicable population, housing, and employment growth projections; 2) project mitigation measures; and 3) appropriate incorporation of AQMP land use planning strategies. The following discussion provides an analysis with respect to each of these criteria. A project is consistent with AQMP, in part, if it is consistent with the population, housing, and employment assumptions that were used in the development of the AQMP. In the case of the 2016 AQMP, three sources of data form the basis for the projections of the air pollutant emissions: the County General Plan, the City General Plan, and SCAG's Regional Transportation Plan (RTP). The County General Plan represents a comprehensive update intended to reflect changing demographics, growth, and infrastructure conditions in the county and was adopted by the County Board of Supervisors on October 6, 2015. The plan serves as a comprehensive, long-term plan for future city development and was originally adopted in 1974. In April 2016, SCAG adopted the 2016-2040 RTP/SCS, which is included in the 2016 AQMP. This provides socioeconomic forecast projections of regional population growth. The population, housing, and employment forecast, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the specific region; these are used by SCAG in all phases of implementation and review.

The project would not directly contribute to population growth in the vicinity of the project as the project does not include new housing. In addition, the project is not expected to create a significant increase in the number of employees as the improvements to the project that would be implemented are not anticipated to increase the average amount of programming, hours, or the daily or annual attendance levels that have been experienced at La Brea Tar Pits. Projected levels of project employees and visitors are consistent with the population and employment forecast for the subregion as adopted by SCAG.

Because these same projections form the basis of the 2016 AQMP, it could be concluded that the project would be consistent with the population and employment growth projections of the AQMP.

The project would incorporate a number of key control measures identified by the SCAQMD, as summarized below. As such, the project meets this AQMP consistency criteria since all feasible mitigation measures would be implemented.

With regard to land use developments, such as the project, air quality policies in the AQMP focus on the reduction of vehicle trips and vehicle miles traveled (VMT). The project would serve to implement a number of land use policies of the County of Los Angeles, the City of Los Angeles, SCAQMD, and SCAG. The project is based on principles of smart growth and environmental sustainability, as evidenced by the accessibility of public transport transit and the availability of existing and planned infrastructure to service the proposed uses.

The project includes various characteristics that minimize VMT and vehicle trips to the project site, including providing a diversity and mix of uses on the project site and within the "Miracle Mile" area, which would minimize vehicle trips and VMT by encouraging walking and non-automotive forms of transportation, and improved design including developing ground-floor museum uses and improved streetscape, which would enhance walkability in the project vicinity, among other project characteristics. To reduce project employee and visitor vehicle trips and increase alternative modes such as walking, bicycling, public transit, and rideshare, the project shall prepare and implement a Transportation Demand Management program, which will be developed in consultation with LADOT. Because the project implements the County of Los Angeles, City of Los Angeles, and SCAQMD objectives of minimizing VMT and the related vehicular air emissions, the project is consistent with AQMP land use policies.

In conclusion, the determination of AQMP consistency is primarily associated with the long-term influence of the project on the air quality in the Air Basin. While development of the project would result in short-term regional impacts for the months of demolition, site preparation, and grading during construction of the project, project development would not have a significant long-term impact on the region's ability to meet state and federal air quality standards. The project would comply with SCAQMD Rule 403 and would implement all feasible mitigation measures. The project would also be consistent with the goals and policies of the AQMP for control of fugitive dust. As discussed above, the project's long-term influence would be consistent with the goals and policies of the AQMP and is, therefore, considered consistent with the SCAQMD's AQMP.

Impact AQ-2 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less Than Significant Impact with Mitigation. A quantitative analysis was conducted to determine whether proposed activities might result in emissions of criteria air pollutants that may cause exceedances of the NAAQS or CAAQS, or cumulatively contribute to existing nonattainment of ambient air quality standards. As previously discussed, criteria air pollutants include O_3, NO_2, CO, SO_2, PM_{10} (coarse particulate matter), $PM_{2.5}$ (fine particulate matter), and lead. Pollutants that are evaluated herein include VOCs and NO_x, which are important because they are precursors to O_3, as well as CO, SO_x, PM_{10}, and $PM_{2.5}$.

The Air Basin is designated as a nonattainment area for federal O_3 and $PM_{2.5}$ standards and the rolling 3-month average lead standard. It is designated as a nonattainment area for state O_3, PM_{10}, and $PM_{2.5}$ standards (CARB 2017b; EPA 2022b). The Air Basin is designated as attainment or unclassified for all other federal and state pollutants.

Construction

Construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (e.g., off-road construction equipment, soil disturbance, VOC off-gassing from asphalt pavement application) and off-site sources (e.g., vendor trucks, haul trucks, and worker vehicle trips). Specifically, entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Internal combustion engines used by construction equipment, haul trucks, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. Construction emissions can vary substantially from day to day depending on the level of activity; the specific type of operation; and, for dust, the prevailing weather conditions.

The project would be required to comply with SCAQMD Rule 403 (SCAQMD 2015) to control dust emissions generated during any dust-generating activities. Standard construction practices that would be employed to reduce fugitive dust emissions include watering of the active dust areas up to three times per day, depending on weather conditions, using water to control dust emissions during demolition activities, washing vehicle wheels before they leave the site, etc. For purposes of estimating project emissions, and based on information provided by the Foundation, it is assumed that construction of the project would last approximately 4 years. Table 8 presents the estimated unmitigated maximum daily construction emissions generated during construction of the project in comparison to the applicable SCAQMD regional significance thresholds. The values shown are the maximum daily emissions results from CalEEMod. Details of the emission calculations are provided in Appendix A.

Table 8. Unmitigated Daily Construction Emissions Summary

Construction Year	Unmitigated Construction Emissions Summary					
	ROG	NOx	CO	PM10	PM2.5	SO2
	Pollutant Emission (pounds per day)					
2024	6.10	57.1	55.8	24.0	11.7	0.08
2025	2.07	13.1	28.2	4.83	1.26	0.03
2026	9.51	13.6	29.9	6.54	1.45	0.03
2027	2.55	17.9	35.8	6.66	1.60	0.04
Peak daily emission	*9.51*	*57.1*	*55.8*	*24.0*	*11.7*	*0.08*
SCAQMD Regional significance thresholds	*75*	*100*	*550*	*150*	*55*	*150*
Threshold exceeded?	*No*	*No*	*No*	*No*	*No*	*No*

Note: ROG = reactive organic gases. Emissions were quantified using CalEEMod version 2022.1.1.17 (CAPCOA 2022).
Summer model results are presented above. Model results (summer, winter, and annual) and assumptions are provided in Appendix A.

As Table 8 shows, estimated unmitigated construction emissions for all pollutants are below SCAQMD regional significance thresholds. Table 9 shows the estimated mitigated emissions with the application of mitigation measures which comply with the standard mitigation measures for fugitive dust control regarding on-site and off-site unpaved roads and all unpaved traffic areas. In CalEEMod, the following mitigation measures were included to reflect these standard mitigation measures for fugitive dust control: reduce speed on unpaved roads to 25 miles per hour, and water exposed areas and active demolition areas two times per day; as well as the Tier 4 Interim mitigation for all off-road equipment greater than 75 horsepower.

Table 9. Mitigated Construction Emissions Summary

Construction Year	Mitigated Construction Emissions Summary					
	ROG	NOx	CO	PM10	PM2.5	SO2
	Pollutant Emission (pounds per day)					
2024	1.66	24.4	48.3	9.01	4.07	0.08
2025	1.47	11.8	30.4	3.39	0.85	0.03
2026	8.96	12.8	32.2	4.05	0.97	0.03
2027	1.76	17.4	38.6	4.02	0.99	0.04
Peak daily emission	*8.96*	*24.4*	*48.3*	*8.98*	*4.07*	*0.08*
SCAQMD significance thresholds	*75*	*100*	*550*	*150*	*55*	*150*
Threshold exceeded?	*No*	*No*	*No*	*No*	*No*	*No*

Note: ROG = reactive organic gases. Emissions were quantified using CalEEMod, version 2022.1.1.17 (CAPCOA 2022).

Summer model results are presented above for daily emissions. Model results (summer, winter, and annual) and assumptions are provided in Appendix A.

As shown in Table 9, daily construction emissions would not exceed the SCAQMD significance thresholds for VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction. Construction-generated emissions would be temporary and would not represent a long-term source of criteria air pollutant emissions. Therefore, impacts would be less than significant.

Operations

Project operations would generate VOCs, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources, including vehicle trips; area sources, including the use of consumer products, architectural coatings for repainting, and landscape maintenance equipment; water, waste, off-road, and stationary sources; and energy sources, including combustion of fuels used for space and water heating. Table 10 presents the maximum daily emissions associated with operation of the project in 2028 at buildout. The values shown are the maximum summer daily emissions results from CalEEMod for each source type. Complete details of the emissions calculations are provided in Appendix A. As shown in Table 10, maximum daily operational emissions of VOCs, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ generated by the project would not exceed the SCAQMD's significance thresholds.

As previously discussed, the Air Basin has been designated as a federal nonattainment area for O_3 and $PM_{2.5}$, and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. The nonattainment status is the result of cumulative emissions from various sources of air pollutants and their precursors within the Air Basin, including motor vehicles, off-road equipment, and commercial and industrial facilities. Construction and operational activities of the project would generate VOCs and NO_x emissions (precursors to O_3) and emissions of PM_{10} and $PM_{2.5}$. However, as indicated in Table 9 and Table 10, project-generated emissions would not exceed the SCAQMD regional emission-based significance thresholds for VOCs, NO_x, PM_{10}, or $PM_{2.5}$.

Table 10. Unmitigated Daily Operational Emissions Summary

Operations Source Type	Unmitigated Operations Emissions Summary					
	ROG	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2
	Pollutant Emission (pounds per day)					
Mobile	4.98	3.17	37.0	8.40	2.17	0.09
Area	2.59	0.04	4.61	0.01	0.01	<0.005
Energy	0.17	3.02	2.54	0.23	0.23	0.02
Off-road	0.03	0.29	0.52	0.01	0.01	<0.005
Stationary	0.84	2.73	3.04	0.12	0.12	<0.005
Total	***8.61***	***9.25***	***47.71***	***8.77***	***2.54***	***0.13***
SCAQMD Regional operational significance thresholds	*55*	*55*	*550*	*150*	*55*	*150*
Threshold exceeded?	*No*	*No*	*No*	*No*	*No*	*No*

Note: ROG = reactive organic gases. CalEEMod emissions were quantified using CalEEMod, version 2022.1.1.17 (CAPCOA 2022).

Summer model results are presented above for daily emissions. Model results (summer, winter, and annual) and assumptions are provided in Appendix A.

The values for each operational source type shown are the maximum summer daily emissions results from the CalEEMod output, assuming operational year 2028. The total values may not sum exactly due to rounding.

Cumulative localized impacts would potentially occur if a project were to occur concurrently with another off-site project. Schedules for potential future projects near the project site are currently unknown; therefore, potential impacts associated with two or more simultaneous projects would be considered speculative. However, future projects would be subject to CEQA and would require air quality analysis and, where necessary, mitigation. Criteria air pollutant emissions associated with construction activity of future projects would be reduced through implementation of control measures required by the SCAQMD. Cumulative PM_{10} and $PM_{2.5}$ emissions would be reduced because all future projects would be subject to SCAQMD Rule 403 (Fugitive Dust), which sets forth general and specific requirements for all sites in the SCAQMD. In addition, cumulative VOC emissions would be subject to SCAQMD Rule 1113 (Architectural Coatings). Therefore, the project would not result in a cumulatively considerable increase in emissions of nonattainment pollutants, and impacts would be less than significant with mitigation during construction and operations.

In summary, the project would not result in a potentially significant contribution to regional concentrations of nonattainment pollutants and would not result in a significant contribution to the adverse health impacts associated with those pollutants. Therefore, impacts would be less than significant with mitigation.

Impact AQ-3 Would the project expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact with Mitigation. A localized significance threshold analysis was performed to evaluate localized air quality impacts to sensitive receptors in the immediate vicinity of the project as a result of project activities. The impacts were analyzed using methods consistent with those in the SCAQMD's *Final Localized Significance Threshold Methodology* (2008a). The project is located within SRA 1 (Central Los Angeles).

The greatest on-site daily emissions of NO_x, CO, PM_{10}, and $PM_{2.5}$ generated during construction occurred during the demolition and site preparation period of the project construction, when, based on information provided by the Foundation and CalEEMod defaults, it was assumed that five rubber-tired dozers and four

tractor/loader/backhoes would be used. CalEEMod default values assume that during an 8-hour day, graders and rubber-tired dozers can each disturb a maximum of 0.5 acre/8-hour day. This results in 4.5 acres disturbed per day. The SCAQMD LST values for 5 acres within SRA 1 with a receptor distance of 25 meters (82 feet), which is consistent with the closest sensitive receptor being approximately 27 meters (87 feet) away, were compared to emissions from the project.

Project construction activities would result in temporary sources of on-site criteria air pollutant emissions associated with construction equipment exhaust and dust-generating activities. According to the Final Localized Significance Threshold Methodology, "off-site mobile emissions from the project should NOT be included in the emissions compared to the LSTs" (SCAQMD 2008a:1-4).

Trucks and worker trips associated with the project are not expected to cause substantial air quality impacts to sensitive receptors along off-site roadways, because emissions would be relatively brief in nature and would cease once the vehicles pass through the main streets. The project emissions below include the off-site mobile emissions and therefore are conservative. The maximum daily on-site construction emissions generated during construction of the project are presented in Table 11 and compared to the SCAQMD LSTs for SRA 1 to determine whether project-generated on-site construction emissions would result in potential LST impacts.

Table 11. Construction Localized Significance Thresholds Analysis

Year	NOx	CO	PM10	PM2.5
	Pounds per Day*			
2024	29.6	48.3	9.01	4.07
2025	12.0	30.4	3.39	0.85
2026	11.8	32.2	4.05	0.97
2027	11.7	38.6	4.02	0.99
SCAQMD construction LST criteria	*161*	*1,861*	*16*	*8*
Threshold exceeded?	*No*	*No*	*No*	*No*

Source: SCAQMD (2009)

* Localized significance thresholds are shown for a 5.0-acre disturbed area corresponding to a distance to a sensitive receptor of 25 meters in SRA 1. Conservatively includes on-site and off-site emissions.

As shown in Table 11, proposed construction activities would not generate emissions in excess of SRA-specific LSTs; therefore, project construction would not expose sensitive receptors to localized emissions concentrations in excess of SCAQMD standards.

The maximum daily on-site emissions generated during operation of the project are presented in Table 12 and compared to the SCAQMD operations localized significance criteria for SRA 1 to determine whether project-generated on-site operations emissions would result in potential LST impacts.

Table 12. Operational Localized Significance Thresholds Analysis

Year	NOx	CO	PM10	PM2.5
	Pounds per Day (On-site)*			
2028	6.04	6.08	0.37	0.37
SCAQMD operational LST criteria	*161*	*1,861*	*4*	*2*
Threshold exceeded?	*No*	*No*	*No*	*No*

Source: SCAQMD (2009)

* Localized significance thresholds are shown for a 5.0-acre disturbed area corresponding to a distance to a sensitive receptor of 25 meters in SRA 1.

As shown in Table 12, proposed operations would not generate emissions in excess of site-specific LSTs; therefore, project operation would not expose sensitive receptors to localized emissions concentrations in excess of SCAQMD standards.

Health Impacts of Toxic Air Contaminants

Construction Health Risk Assessment

As discussed in Section 6.4.1, a construction HRA was performed to estimate the Maximum Individual Cancer Risk and the Chronic Hazard Index for residential receptors as a result of project construction. Results of the construction HRA are presented in Table 13.

Table 13. Construction Health Risk Assessment Results – Unmitigated

Impact Parameter	Unit	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	per million	78.07	10	**Potentially Significant**
Chronic Hazard Index – Residential	Index Value	0.08	1.0	Less than Significant

Source: SCAQMD (2019)
Note: See Appendix B for detailed results.

As shown in Table 13, the HRA results from the unmitigated scenario show that project construction would result in a Residential Chronic Hazard Index of 0.008, which is below the 1.0 significance threshold; however, project construction would result in cancer risks exceeding the 10 in 1 million threshold, resulting in a potentially significant impact at the maximally exposed individual residential receptors. Mitigation Measure AQ-1 (MM-AQ-1) has been identified to reduce project construction-generated DPM emissions to the extent feasible through requiring all 75 horsepower or greater diesel-powered equipment to be powered with CARB certified Tier 4 Interim engines, and all other diesel fueled equipment to use engines classified as Tier 3 or higher. The HRA results after incorporation of MM-AQ-1 are presented in Table 14.

Table 14. Construction Health Risk Assessment Results – Mitigated

Impact Parameter	Unit	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	per million	8.95	10	Less than Significant
Chronic Hazard Index – Residential	Index Value	0.007	1.0	Less than Significant

Source: SCAQMD (2019)
Note: See Appendix B for detailed results.

As shown in Table 14, with the implementation of mitigation MM-AQ-1, the estimated cancer risk during project construction would be reduced below the SCAQMD threshold of 10 in 1 million. Therefore, potential impacts to sensitive receptors associated with construction of the project would be less than significant with mitigation.

Operational Health Risk Assessment

As discussed in Section 6.4.2, an operational HRA was performed to estimate the Maximum Individual Cancer Risk and the Chronic Hazard Index for residential receptors as a result of project operations,

including truck trips and off-road/stationary equipment. Results of the operational HRA are presented in Table 15. The analysis was performed based on a 6-day per week operation. However, the actual operation is 5 days per week, therefore, the following analysis of operational HRA is considered conservative.

Table 15. Operational Health Risk Assessment Results – Unmitigated

Impact Parameter	Unit	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	per million	7.81	10	Less than Significant
Chronic Hazard Index – Residential	Index Value	0.003	1.0	Less than Significant

Source: SCAQMD (2019)
Note: See Appendix B for detailed results.

As shown in Table 15, project operational activities would result in a Residential Maximum Individual Cancer Risk of 7.81 in 1 million, which would be less than the significance threshold of 10 in 1 million. Project operations would also result in a Residential Chronic Hazard Index of 0.003, which is below the 1.0 significance threshold. Thus, operational impacts associated with potential cancer risk would be less than significant.

Cancer Burden

As discussed above, a construction HRA was performed to estimate the Maximum Individual Cancer Risk and the Chronic Hazard Index for residential receptors as a result of project construction. Since the cancer risk from project operation at the maximally exposed individual resident exceeds 1 in 1 million, cancer burden, for which a SCAQMD significance threshold of 0.5, is evaluated. Unlike cancer risk, which is the lifetime probability (chances) of an individual developing cancer due to exposure to a carcinogenic compound, cancer burden estimates the number of theoretical cancer cases in a defined population resulting from a lifetime exposure to carcinogenic TACs. As described in the OEHHA guidance manual:

> The cancer burden can be calculated by multiplying the cancer risk at a census block centroid by the number of people who live in the census block, and adding up the estimated number of potential cancer cases across the zone of impact. The result of this calculation is a single number that is intended to estimate of the number of potential cancer cases within the population that was exposed to the emissions for a lifetime (70 years). (OEHHA 2015:8-16)

The SCAQMD has established a procedural screening approach for estimating cancer burden (SCAQMD 2017), which includes the following steps:

- Recalculate cancer risk from all TACs using a 70-year exposure duration.
- Estimate the distance at which the at which maximum individual cancer risk from a 70-year exposure duration falls below 1 in 1 million.
- Define a zone of impact in the shape of a circle, with the radius equal to the distance between the TAC source and the point at which the risk falls below 1 in 1 million.
- Estimate the residential population within this zone of impact based on census data or a worse-case estimate.
- Calculate the screening level cancer burden by multiplying the total residential population in the zone of impact by the maximum individual cancer risk.

The maximum estimated 70-year cancer risk for project operation was estimated at 8.95 in 1 million. The total population in the zone of impact area was estimated to be approximately 24,644 persons, based on the average densities of the Census Tracts that would be within the zone of impact (Census Tracts 2151.01, 2151.02, 2162.01, 2163.02, 2145.01, 2145.03, 2145.04, and 2147) (U.S. Census Bureau 2020).

Multiplying the maximum estimated 70-year cancer risk by the project population gives a cancer burden of 0.32. Accordingly, the cancer burden indicates that less than one person could contract cancer assuming a 70-year exposure under the modeled scenario of TAC emissions and provided that other factors related to an individual's susceptibility to contracting cancer would occur. An estimated cancer burden of 0.32 would be less than the SCAQMD cancer burden threshold of 0.5. Thus, the impact with respect to potential cancer burden due to project operations would be less than significant.

Local Carbon Monoxide Concentrations

At the time that the SCAQMD 1993 Handbook was published, the Air Basin was designated nonattainment under the CAAQS and NAAQS for CO. In 2007, the SCAQMD was designated in attainment for CO under both the CAAQS and NAAQS as a result of the steady decline in CO concentrations in the Air Basin due to turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities. The SCAQMD conducted CO modeling for the 2003 AQMP (Appendix V: Modeling and Attainment Demonstrations, SCAQMD 2003c) for the four worst-case intersections in the Air Basin: 1) Wilshire Boulevard and Veteran Avenue, 2) Sunset Boulevard and Highland Avenue, 3) La Cienega Boulevard and Century Boulevard, and 4) Long Beach Boulevard and Imperial Highway. At the time the 2003 AQMP was prepared, the intersection of Wilshire Boulevard and Veteran Avenue was the most congested intersection in Los Angeles County, with an average daily traffic volume of about 100,000 vehicles per day. Using CO emission factors for 2002, the peak modeled CO 1-hour concentration was estimated to be 4.6 ppm at the intersection of Wilshire Boulevard and Veteran Avenue. When added to the maximum 1-hour CO concentration from 2018 through 2020 at the North Main Street monitoring station (which was 2 ppm in 2019), the 1-hour CO concentration would be 6.6 ppm, while the CAAQS is 20 ppm.

The 2003 AQMP also projected 8-hour CO concentrations at these four intersections for 1997 and from 2002 through 2005. From years 2002 through 2005, the maximum 8-hour CO concentration was 3.8 ppm at the Sunset Boulevard and Highland Avenue intersection in 2002; the maximum 8-hour CO concentration was 3.4 ppm at the Wilshire Boulevard and Veteran Avenue in 2002. Adding the 3.8 ppm to the maximum 8-hour CO concentration from 2018 through 2020 at the North Main Street monitoring station (which was 1.7 ppm in 2018), the 8-hour CO would be 5.5 ppm, while the CAAQS is 9.0 ppm. Accordingly, CO concentrations at congested intersections would not exceed the 1-hour or 8-hour CO CAAQS unless projected daily traffic would be at least over 100,000 vehicles per day. Because the project would not increase daily traffic volumes at any study intersection to more than 100,000 vehicles per day as shown in the La Brea Tar Pits Master Plan Final Transportation Assessment (Kittelson & Associates, Inc. 2022), a CO hot spot is not anticipated to occur, and associated impacts would be less than significant.

Impact AQ-4 Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact. According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project does not include any uses identified by the SCAQMD as being associated with odors.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust and architectural coatings. However, construction-related odors would only occur when construction is active and cease upon project completion. In addition, the project would be required to comply with 13 CCR 2449(d)(3) and 2485, which require minimizing construction equipment idling time by either shutting it off when not in use or by reducing the time of idling to no more than 5 minutes. This would further reduce the detectable odors from heavy-duty equipment exhaust. The project would also comply with the SCAQMD Regulation XI, Rule 1113 – Architectural Coating, which would minimize odor impacts from reactive organic gas emissions during architectural coating. The project site is not located in an area of naturally occurring asbestos and asbestos-containing materials are a potential due to a small amount of demolition. SCAQMD Rule 403 also contains measures that are required to be incorporated that would reduce emissions. Any impacts to existing adjacent land uses would be short term and are less than significant.

Operation of the project does not include any component with the potential to generate odorous emissions that could affect a substantial number of people. Therefore, there would be a less-than-significant impact from construction and operations.

Impact GHG-1 Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Impact GHG-2 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Less than Significant Impact with Mitigation.

Construction Emissions

Construction of the project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles. The SCAQMD *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* (2008b:309) recommends that, "construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies." Thus, the total construction GHG emissions were calculated, amortized over 30 years, and added to the total operational emissions.

CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Section 6.1. Construction of the project is anticipated last a total of approximately 4 years. On-site sources of GHG emissions include off-road equipment and off-site sources including vendor trucks and worker vehicles. Table 16 presents construction emissions for the project from on-site and off-site emission sources.

As shown in Table 16, the estimated total GHG emissions during construction would be approximately 3,962 $MTCO_2e$ over the construction period. Estimated project-generated construction emissions amortized over 30 years would be approximately 132 $MTCO_2e$ per year. As with project-generated construction criteria air pollutant emissions, GHG emissions generated during construction of the project would only occur when construction is active, lasting only for the duration of the construction period, and would not represent a long-term source of GHG emissions.

Table 16. Estimated Annual Construction Greenhouse Gas Emissions

Construction Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
2024	1,495	0.06	0.05	1,513
2025	889	0.04	0.04	902
2026	895	0.04	0.04	908
2027	632	0.02	0.02	639
Total	**3,911**	**0.16**	**0.15**	**3,962**
		Amortized construction emissions		***132.07***

Source: Appendix A.

Due to the potential persistence of GHGs in the environment, impacts are based on annual emissions and, in accordance with draft SCAQMD methodology, construction-period impacts are not assessed for significance independent of operational-period impacts, which are discussed in the next section. The total Project GHG emissions include the estimated annual operational project-generated GHG emissions, as well as the construction GHG emissions which have been amortized over the estimated life of the project.

Operational Emissions

Operation of the project would generate GHG emissions through motor vehicle trips to and from the project site, landscape maintenance equipment operation, energy use (natural gas and generation of electricity consumed by the project), natural gas-fueled emergency generator maintenance and testing, solid waste disposal, off-road and stationary equipment, and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. CalEEMod was used to calculate the annual GHG emissions.

The estimated operational project-generated GHG emissions from area sources, energy usage, motor vehicles, off-road and stationary sources, solid waste generation, and water usage and wastewater generation are shown in Table 17.

Table 17. Estimated Annual Operational Greenhouse Gas Emissions

Operations Type	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Mobile	1,314	0.07	0.06	1,335
Area	2.15	< 0.005	< 0.005	2.16
Energy	940	0.08	< 0.005	943
Water	8.12	0.11	< 0.005	11.6
Waste	8.76	0.88	0.00	30.6
Refrigeration	0	0	0.00	0.07
Off-road	8.99	< 0.005	< 0.005	9.02
Stationary	19.4	< 0.005	< 0.005	19.5
Total	**2,301**	**1.13**	**0.07**	**2,351**
			Amortized construction emissions	*132.07*
			Total operational + amortized construction GHGs	***2,483.07***

Source: Appendix A

Note: These emissions reflect operational year 2028.

As shown in Table 17, estimated annual project-generated GHG emissions would be approximately 2,351 $MTCO_2e$ per year from project operations only. After summing the amortized project construction emissions, total GHGs generated by the project would be approximately 2,483 $MTCO_2e$ per year, which is less than the SCAQMD interim screening-level threshold of 3,000 $MTCO_2e$ per year.

As noted above, it is also important to ensure that the project provides a "fair share" contribution to achieve the State's carbon neutrality goal. Given the project plans have not been fully developed, it is not yet determined whether the project includes the installation of natural gas infrastructure and/or the use of natural gas–fired appliances. Further, while a commitment to electric vehicle charging stations has been made, the number of charging stations that would be installed is not known. For these reasons, the project could result in a *significant impact* to GHGs. However, with implementation of the mitigation measures provided in Section 7.2, impacts would be less than significant.

Consistency with Applicable Plans and Policies

As stated above, the GHG impact analysis uses two different significance thresholds: a quantitative threshold, and consistency with GHG reduction plan and policies. Impact GHG-1's quantification of the project's potential GHG emissions is supplemented below with Impact GHG-2's consistency analysis with GHG reduction plans and policies. In the absence of any final adopted quantitative threshold, the significance of the project's GHG emissions is evaluated consistent with State CEQA Guidelines Section 15064.4(b)(2) by considering whether the project complies with applicable plans, policies, regulations, and requirements adopted for the purpose of reducing the emission of GHGs.

CARB's Climate Change Scope Plan

The Climate Change Scoping Plan outlines a framework that relies on a broad array of GHG reduction actions, including direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based mechanisms, such as the cap-and-trade program. The Climate Change Scoping Plan builds off of a wide array of regulatory requirements that have been promulgated to reduce statewide GHG emissions, particularly from energy demand and mobile sources. While these regulatory requirements are not targeted at specific land use development projects, they would indirectly reduce a development project's GHG emissions. A discussion of these regulatory requirements that would reduce· the project's GHG emissions is provided below. As detailed below, the project would not conflict with the Climate Change Scoping Plan and the implementation of GHG reduction strategies.

California Renewable Portfolio Standard (RPS) Program SB 100 and SB 350

While this action does not directly apply to individual projects, the project complies with the RPS program inasmuch as its electricity is provided by LADWP, which, in compliance with the RPS program, is required to obtain 33% renewable power by 2020, and has committed to achieving 50% renewable power by 2025. Furthermore, per the updated requirements of SB 100 (2018), LADWP would be required to procure eligible renewable electricity for 44% of retail sales by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, and should plan to achieve 100% eligible renewable energy resources and zero carbon resources by December 31, 2045. Thus, the project would be supplied with electricity via renewable sources at increasing rates over time, reducing the project's electricity-related GHG emissions. As required under SB 350, doubling of the energy efficiency savings from final end uses of retail customers by 2030 would primarily rely on the existing suite of building energy efficiency standards under CCR Title 24, Part 6 and utility-sponsored programs such as rebates for high-efficiency appliances, heating, ventilation, and air conditioning (HVAC) systems, and insulation. The project would comply with Title 24 Standards.

SB 1368/AB 398, CCR Title 20, Cap-And-Trade Program

The State's cap-and-trade Program reduces GHG emissions from major sources (deemed "covered entities") by setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve emission reduction targets. While the cap-and-trade program does not directly apply to individual projects, the project would benefit from the program inasmuch as the project's electricity usage and mobile source emissions would be covered by the cap-and-trade program since LADWP and California fuel suppliers are covered entities, resulting in an indirect reduction of GHG emissions from the project's energy consumption and mobile source emissions.

Title 24 Building Energy Efficiency Standards, and the CALGreen Code

The project would meet or exceed the energy standards in the Title 24 Building Energy Efficiency Standards and the CALGreen Code, and would implement project design features, including solar photovoltaic panels on the roof of the project building to reduce the amount of electricity drawn from City utilities. Additionally, the project would provide sustainability features, such as rainwater collection leading to bioswales; a sloped green roof; rooftop solar photovoltaic panels; HVAC systems that would be sized and designed in compliance with the CALGreen Code to maximize energy efficiency caused by heat loss and heat gain; new and existing tree canopies to protect building walls from sun exposure and provide shade for the ground area; and the use of drought-tolerant landscaping to reduce water demand and avoid the use of pesticides. All of these features would reduce the project's outdoor and indoor water demand, which would reduce the project's GHG emissions associated with water conveyance and wastewater treatment. As stated previously, the 2008 Climate Change Scoping Plan notes that water use requires significant amounts of energy, comprising approximately one-fifth of statewide electricity.

AB 1493 (Pavley Regulations)

The State's Pavley Regulations apply to new passenger vehicles from model year 2012 through 2016 (Phase I) and model years 2017 through 2025 (Phase II). While this action does not apply to individual projects, future employees and visitors to the project site would purchase new vehicles in compliance with this regulation. Mobile source emissions generated by future visitors and employees would be reduced with implementation of AB 1493. However, it is noted that the vehicle emissions standards beyond model year 2020 may not occur if the federal SAFE Vehicles Rules and the One National Program on Federal Preemption of State Fuel Economy Standards are upheld by the Advanced Clean Cars programs.
The Advanced Clean Cars program includes Low-Emission Vehicle regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the ZEV regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years. While this action does not directly apply to individual projects, the standards would apply to all vehicles purchased or used by visitors and employees to the project. The project would designate a minimum of 8% of on-site parking for carpool and/or alternative-fueled vehicles. As such, the project would support compliance with this regulation.

Advanced Clean Truck Regulation

The Advanced Clean Truck Regulation has two components, a manufacturer sales requirement and a reporting requirement. The manufacturer component of the regulation requires manufacturers that certify Class 2b-8 chassis or complete vehicles with combustion engines would be required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b-3 truck sales, 75% of Class 4-8 straight truck sales, and 40% of truck tractor sales. The reporting component of the regulation requires large employers, including retailers, manufacturers, brokers, and others, to report information about shipments

and shuttle services. Fleet owners (with 50 or more trucks) would be required to report on their existing fleet operations. This information would help identify future strategies to ensure that fleets purchase available zero-emission trucks and place them in service where suitable to meet their needs. This would be applicable to occasional delivery trucks to the project.

Low Carbon Fuel Standard (EO S-01-07)

This regulation establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 7.5% by 2020, and a 20% reduction in carbon intensity from a 2010 baseline by 2030. While this action does not directly apply to individual projects, future employees and visitors to the project would use transportation fuels in compliance with this regulation. GHG emissions related to vehicular travel by project would benefit from this regulation and mobile source emissions generated by future employees and visitors to the project would be reduced with implementation of the LCFS.

SB 375

SB 375 establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions. Under SB 375, CARB is required, in consultation with the State's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035. While this action does not directly apply to individual projects, the project would not conflict with the SCAG 2020-2045 RTP/SCS goals and objectives under SB 375 to implement "smart growth." As discussed below, the project would not conflict with the SCAG 2020-2045 RTP/SCS.
The project would incorporate physical and operational project characteristics that would reduce vehicle trips and VMT and encourage alternative modes of transportation for visitors and employees. The project would support reducing VMT given its location at an urban infill location with nearby access to public transportation within 0.25 mile of the project. The project site is well served by public transit. Specifically, the Los Angeles County Metropolitan Transportation Authority (Metro) 20 and 720 bus lines on Wilshire Boulevard and the Metro 217, 218, and 780 bus lines on Fairfax Avenue all stop within half a block of the project site. In addition, Metro is currently constructing an extension of the Metro system D Line (Purple). This Metro project will construct three new heavy-rail subway stations along Wilshire Boulevard, which will serve the project site. The new stations will be located at Wilshire Boulevard/La Brea Avenue, Wilshire Boulevard/Fairfax Avenue, and Wilshire Boulevard/La Cienega Boulevard. They are slated to open for service in 2024. The project would also reduce vehicle trips and VMT by implementing a Transportation Demand Management program for employee and visitor vehicle trips to increase alternative modes such as walking, bicycling, public transit, and rideshare. To further reduce reliance on fossil fuels and transportation-related GHG emissions, the project could designate a minimum of 8% of on-site parking for carpool and/or alternative-fueled vehicles.

California Integrated Waste Management Act of 1989 and AB 341

The Integrated Waste Management Act (IWMA) mandated that State agencies develop and implement an integrated waste management plan which outlines the steps to be taken to divert at least 50% of their solid waste from disposal facilities. AB 341 directs CalRecycle to develop and adopt regulations for mandatory commercial recycling and sets a statewide goal for 75% disposal reduction by the year 2020. In addition, the City has developed and is in the process of implementing the Solid Waste Integrated Resources Plan, also referred to as the Zero Waste Plan, the goal of which is to lead the City toward being a "zero waste" city by 2030. While this action does not directly apply to individual projects, the project would benefit from the IWMA and the Solid Waste Integrated Resources Plan inasmuch as it would be served by a solid waste collection and recycling service that would include mixed-waste processing, and that yields waste diversion results comparable to source separation and consistent with citywide recycling targets. According to the City of Los Angeles Zero Waste Progress Report (March 2013), the City achieved a landfill diversion rate of approximately 76% by year 2012.

As demonstrated above, the project would not conflict with the future anticipated statewide GHG reduction goals. CARB has outlined a number of potential strategies for achieving the 2030 statewide reduction target of 40% below 1990 levels, as mandated by SB 32. These potential strategies include using renewable resources for half of the State's electricity by 2030, increasing the fuel economy of vehicles and the number of zero-emission or hybrid vehicles, reducing the rate of growth in VMT, supporting other alternative transportation options, and use of high-efficiency appliances, water heaters, and HVAC systems. The project would benefit from statewide and utility-provider efforts toward increasing the portion of electricity provided from renewable resources. The utility provider for the project, LADWP, provided 35% of 2021 electricity purchases from renewable sources and is required to provide 50% by 2025, 60% by 2030, and 100% by 2045. The project would also benefit from statewide efforts toward increasing the fuel economy standards of vehicles. The project would support reducing VMT, given its location at an infill site close to existing transit options, as described above. As a result, the project would not conflict with applicable Climate Change Scoping Plan strategies and regulations to reduce GHG emissions.

Post-2030 Analysis

The 2017 and 2022 Scoping Plan also outline strategies to reduce GHG emissions to achieve the 2030 target from sectors that are not directly controlled or influenced by the project, but nonetheless contribute to project-related GHG emissions. For instance, the project itself is not subject to the cap-and-trade regulation; however, project-related emissions would decline pursuant to the regulation as utility providers and transportation fuel producers are subject to renewable energy standards, cap-and-trade, and the LCFS. While CARB is in the process of expanding the regulatory framework to meet the 2030 reduction target based on the existing laws and strategies in the 2022 Scoping Plan, the project would support or not impede implementation of these potential GHG reduction strategies identified by CARB for all the reasons summarized above.

A report was published on the California PATHWAYS model that determined that "meeting the state's 2030 climate goals requires scaling up and using technologies already in the market such as energy efficiency and renewables, while pursing aggressive market transformation of new technologies that have not yet been utilized at scale in California (for example, zero-emission vehicles and electric heat pumps)" (CEC 2018:3). Priority GHG reduction strategies include energy efficiency in buildings, renewable energy, and smart growth through increased use of public transit, walking, biking, telepresence, and denser, mixed-use community design. The project would not conflict with these strategies, given it would incorporate renewable energy measures, including solar photovoltaic panels to reduce the amount of electricity drawn from City utilities, and energy efficient measures, including water demand reduction measures, minimizing energy use to support efforts by its utility provider, LADWP, to obtain renewable energy pursuant to State mandates. Furthermore, the project would support the priority market transformation strategy of zero-emission light-duty vehicles by providing for the installation of the conduit and panel capacity to accommodate future electric vehicle charging stations. Therefore, the project would not conflict with the findings relevant to the project from the updated California PATHWAYS model report (CEC 2018).

With statewide efforts underway to facilitate the State's achievement of those goals, it is reasonable to expect the project's GHG emissions to decline from their early operational years, as the regulatory initiatives identified by CARB in the 2022 Scoping Plan are implemented, and other technological innovations occur. Stated differently, the project's emissions at buildout likely represent the maximum emissions for the project, as anticipated regulatory developments and technology advances are expected to reduce emissions associated with the project, such as emissions related to electricity use and vehicle use.

Even though the 2022 Scoping Plan and supporting documentation do not provide an exact regulatory and technological roadmap to achieve 2050 goals, they demonstrate that various combinations of policies could allow the Statewide emissions level to remain very low through 2050, suggesting that the combination of new technologies and other regulations not analyzed in the study or not currently feasible at the time the 2022 Scoping Plan was adopted could enable the State to meet the 2050 targets. For example, the 2022 Scoping Plan states some policies are not feasible at this time, such as Net Zero Carbon Buildings, but that this type of policy would be necessary to meet the 2050 target.

Based on the above, the project would not conflict with CARB's Climate Change Scoping Plan, and there would be an anticipated decline in project emissions once fully constructed and operational; the project would not conflict with the State's GHG reduction targets for 2030 and 2050. Therefore, impacts would be less than significant.

SCAG's 2020-2045 RTP/SCS

Transportation-related GHG emissions would be the largest source of emissions from the project. This finding is consistent with the findings in regional plans, including the 2020-2045 RTP/SCS, which recognizes that the transportation sector is the largest contributor to the state's GHG emissions. At the regional level, the 2020-2045 RTP/SCS is an applicable plan adopted for the purpose of reducing GHGs.

The purpose of the 2020-2045 RTP/SCS is to achieve the regional per-capita GHG reduction targets for the passenger vehicle and light-duty truck sector established by CARB pursuant to SB 375. To accomplish this goal, the 2020-2045 RTP/SCS identifies various strategies to reduce per-capita VMT. The 2020-2045 RTP/SCS is expected to help SCAG reach its GHG reduction goals, as identified by CARB, with reductions in per-capita passenger vehicle GHG emissions for specified target years.

In addition to demonstrating the region's ability to attain and exceed the GHG emission reduction targets set forth by CARB, the 2020-2045 RTP/SCS outlines a series of actions and strategies for integrating the transportation network with an overall land use pattern that responds to projected growth, housing needs, changing demographics, and transportation demands. Thus, successful implementation of the 2020-2045 RTP/SCS would result in more complete communities with a variety of transportation and housing choices, while reducing automobile use. Regarding individual developments, such as the project, strategies and policies set forth in the 2020-2045 RTP/SCS can be grouped into the following three categories: 1) reduction of vehicle trips and VMT, 2) increased use of alternative fuel vehicles, and 3) improved energy efficiency. These strategies and policies are addressed below.

In order to assess the project's potential to conflict with the 2020-2045 RTP/SCS, this section analyzes the project's land use characteristics for consistency with the strategies and policies set forth in the 2020-2045 RTP/SCS to meet GHG emission-reduction targets set by CARB. Generally, projects are considered to not conflict with applicable land use plans and regulations, such as SCAG's 2020-2045 RTP/SCS, if they are compatible with the general intent of the plans and would not preclude the attainment of their primary goals. The project would not conflict with the 2020-2045 RTP/SCS goals and benefits intended to improve mobility and access to diverse destinations, provide better "placemaking," provide more transportation choices, and reduce vehicular demand and associated emissions. Thus, successful implementation of the 2020-2045 RTP/SCS would result in more complete communities with a variety of transportation and housing choices, while reducing automobile use.

Integrated Growth Forecast

The 2020-2045 RTP/SCS provides socioeconomic forecast projections of regional population growth. The population, housing, and employment forecasts, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the specific area; these are used by SCAG in all

phases of implementation and review. While the project does not propose residential uses, new employees would be introduced by the project. According to the 2020-2045 RTP/SCS, the employment forecast for the City of Los Angeles Subregion in 2021 is approximately 1,897,883 employees. In 2028, the projected operation year of the project, the City of Los Angeles Subregion is anticipated to have 1,937,552 employees. Thus, the project's estimated 42 employees would constitute a very small percentage of the city's employment growth forecasted between 2021 and 2028. Accordingly, the project's generation of employees would not conflict with employment generation projections contained in the 2020-2045 RTP/SCS.

VMT Reduction Strategies and Policies

The project site is well served by public transit. Specifically, the Metro 20 and 720 bus lines on Wilshire Boulevard and the Metro 217, 218, and 780 bus lines on Fairfax Avenue all stop within half a block of the project site. In addition, Metro is currently constructing an extension of the Metro system D Line (Purple), which will include construction of three new heavy-rail subway stations along Wilshire Boulevard, which will serve the project site. The new stations will be located at Wilshire Boulevard/La Brea Avenue, Wilshire Boulevard/Fairfax Avenue, and Wilshire Boulevard/La Cienega Boulevard. They are slated to open for service in 2024.

In addition, the project was reviewed to determine potential inconsistencies with GHG reduction targets forecasted in the SCAG RTP/SCS. The project was analyzed using a total VMT threshold (as opposed to an efficiency-based impact threshold). The project site functions as a regional attraction and the proposed project would result in a net increase in regional VMT. Since the project would result in a net increase in VMT, further evaluation was necessary to determine whether this project would be inconsistent with the VMT and GHG reduction goals of the SCAG RTP/SCS.

It was determined that, without mitigation measures, the project may be inconsistent with SCAG's goals related to improving mobility and accessibility, ensuring safety, maximizing transportation productivity, encouraging active transportation, and improving air quality. The project does not include transportation improvements to encourage and improve active transportation and public transit outside of on-site access and circulation improvements.

In conclusion, the project may conflict with the following relevant RTP/SCS goals:

- Improve mobility, accessibility, reliability, and travel safety for people and goods
- Enhance the preservation, security, and resilience of the regional transportation system
- Increase person and goods movement and travel choices within the transportation system
- Reduce GHG emissions and improve air quality
- Leverage new transportation technologies and data-driven solutions that result in more efficient travel

Energy Efficiency Strategies and Policies

The 2020-2045 RTP/SCS includes strategies for individual developments, such as the project, to improve energy efficiency (e.g., reducing energy consumption) to reduce GHG emissions. The project has been designed and would be constructed to incorporate environmentally sustainable building features and construction protocols identified in the CALGreen Code. These standards would reduce energy and water usage and waste and, thereby, reduce associated GHG emissions and help minimize the impact on natural resources and infrastructure. The project would include energy-saving measures, including enhanced daylighting; rainwater collection leading to bioswales; a sloped green roof; rooftop solar photovoltaic panels; HVAC systems that would be sized and designed in compliance with the CALGreen Code to

maximize energy efficiency caused by heat loss and heat gain; and new and existing tree canopies to protect building walls from sun exposure and provide shade for the ground area. Daylighting is the controlled admission of natural light, direct sunlight, and diffused-skylight into a building to reduce electric lighting and save energy. By providing a direct link to the dynamic and perpetually evolving patterns of outdoor illumination, daylighting helps create a visually stimulating and productive environment for building occupants, while reducing as much as one-third of total building energy costs. These measures were generally accounted for based on compliance with Title 24 standards. Furthermore, the project would incorporate design features, such as solar photovoltaic panels, to reduce the amount of electricity demand from City utilities.

The project would include water sustainability features, which would include, but not be limited to, the installation of low-flow toilets, low-flow faucets, low-flow showers, and other energy and resource conservation measures. In addition, the project would provide sustainability features, such as stormwater capture and reuse system and drought-tolerant landscaping, to reduce the project's outdoor water demand, thereby reducing the project's GHG emissions associated with water conveyance and wastewater treatment. Therefore, based on the above, the project would not conflict with energy strategies in the 2020-2045 RTP/SCS.

County of Los Angeles General Plan

The project would meet the County's General Plan goals to address the impact of GHGs and climate change. The project would implement project design features to reduce energy consumption and encourage energy conservation. Additionally, HVAC systems would be sized and designed in compliance with the CALGreen Code to maximize energy efficiency caused by heat loss and heat gain; and new and existing tree canopies would protect building walls from sun exposure and provide shade for the ground area. The project would provide sustainability features, such as rainwater collection leading to bioswales, a sloped green roof, and the use of drought-tolerant landscaping to reduce water consumption. All of these features would reduce the project's energy consumption, reduce water consumption, and encourage energy conservation. As such, the project would not conflict with the goals of the County of Los Angeles General Plan.

OurCounty – Los Angeles Countywide Sustainability Plan

The project would be consistent with the OurCounty regional sustainability plan, which includes 12 goals. The project would implement project design features to reduce energy consumption and encourage energy conservation. Additionally, HVAC systems would be sized and designed in compliance with the CALGreen standards and the County of Los Angeles Green Building Standards Code to maximize energy efficiency caused by heat loss and heat gain. New and existing tree canopies would protect building walls from sun exposure and provide shade for the ground area. The project would also provide sustainability features, such as rainwater collection leading to bioswales, a sloped green roof, and the use of drought-tolerant landscaping to reduce water consumption. All these features would use efficient technologies and practices that reduce resource use, improve health, and increase resilience and would effectively manage waste, water, energy, and material resources consistent with the goals of OurCounty. For these reasons, the project would not conflict with the goals of the OurCounty Countywide Sustainability Plan.

City of Los Angeles General Plan

The project would meet the City's General Plan goals, objectives, and policies to address the air quality improvement programs and strategies (City of Los Angeles 2015). Consistent with the six goals of the City of Los Angeles General Plan, the project would reduce particulate air pollutants emanating from unpaved areas, parking lots, and construction sites by complying with SCAQMD Rule 403 requiring fugitive dust control measures. The project would also provide visitors with the ability to access nearby

public transit and opportunities for walking and biking, which would facilitate minimization of VMT and related vehicular GHG emissions, and would not conflict with the goals to reduce VMT. Bicycle parking and connections to walking and biking paths would also be provided. The project would implement project design features to reduce energy consumption and encourage energy conservation. Features of the project would reduce the project's energy consumption, reduce water consumption, and encourage energy conservation, supporting the City General Plan goals for a reduction in energy consumption, a shift to nonpolluting sources of energy in its buildings and operations, and reducing energy consumption and associated air emissions by encouraging waste reduction and recycling. For these reasons, the project would not conflict with the City of Los Angeles General Plan.

City of Los Angeles Green LA Action Plan

The project would be consistent with the City of Los Angeles Green LA Action Plan by including project design features to reduce energy consumption and encourage energy conservation (City of Los Angeles 2007). Additionally, HVAC systems would be sized and designed in compliance with the CALGreen standards and the County of Los Angeles Green Building Standards Code to maximize energy efficiency caused by heat loss and heat gain. New and existing tree canopies would protect building walls from sun exposure and provide shade for the ground area.

City of Los Angeles Green New Deal/Sustainable City Plan

The City's Green New Deal includes both short-term and long-term aspirations through the year 2050 in various topic areas, including water, solar power, energy-efficient buildings, carbon and climate leadership, waste and landfills, housing and development, mobility and transit, and air quality, among others. While not a plan adopted solely to reduce GHG emissions, within the City's Green New Deal, climate mitigation is one of eight explicit benefits that help define its strategies and goals. Although the Green New Deal mainly targets GHG emissions related to City-owned buildings and operations, certain reductions associated with the project would promote the Green New Deal's goals. Such measures include increasing renewable energy usage, reduction of per-capita water usage, promotion of walking and biking, promotion of educational and recreational uses close to transit, and various recycling and trash diversion goals.

Although the City's Green New Deal is not an adopted plan or directly applicable to private development projects, the project would not conflict with these aspirations as it is an infill development consisting of educational and recreational uses on a project in proximity to transit. In addition, the project would comply with Title 24 Standards and would implement measures to reduce overall energy usage compared to baseline conditions. Furthermore, the project would also result in GHG reductions beyond those specified by the City and would minimize its GHG emissions by implementing project design features that reduce electricity and water consumption. The project would be serviced by providers who comply with the City of Los Angeles Solid Waste Management Policy Plan, and the Exclusive Franchise System Ordinance (Ordinance No. 182,986) to further the aspirations included in the Green New Deal with regard to energy-efficient buildings, waste, and landfills. The project would also provide bicycle parking and connections to walking and biking paths to further reduce VMT and decrease GHG emissions.

Therefore, as the project's GHG emissions would be generated in connection with a development located within the city and designed to be consistent with the applicable City plan goals and actions for reducing GHG emissions, the project would not conflict with these City plans adopted for the purpose of reducing GHG emissions, and the project's GHG emissions would result in less-than-significant impacts.

Conclusion

In summary, Impact GHG-1 would be significant given the project plans have not been fully developed and it cannot yet be determined whether the project includes the installation of natural gas infrastructure and/or the use of natural gas–fired appliances. Further, while a commitment to electric vehicle charging stations has been made, the number of charging stations that would be installed is not known. For these reasons, the project could result in a significant impact related to GHG. However, with implementation of the mitigation measures provided in Section 7.2, impacts would be less than significant.

Regarding Impact GHG-2, the project may be inconsistent with regional plans related to mobility and GHG reductions, specifically in relation to SCAG's 2020-2045 RTP/SCS. It was determined that without mitigation measures, the project may be inconsistent with SCAG's goals related to improving mobility and accessibility, transportation productivity, and encouraging active transportation. The project does not include transportation improvements to encourage and improve active transportation and public transit outside of on-site access and circulation improvements. However the project does include design features that would reduce the project's energy consumption, reduce water consumption, and encourage energy conservation, as well as provide visitors with public transportation incentives, with the ability to access nearby public transit and opportunities for walking and biking, all of which are consistent with the County of Los Angeles General Plan, OurCounty Countywide Sustainability Plan, City of Los Angeles General Plan, City of Los Angeles Green LA Action Plan, and the City's Green New Deal. Thus, the project could result in a significant impact related to consistency with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. However, with implementation of the mitigation measures provided in Section 7.2, impacts would be less than significant.

7.1 Cumulative Impacts

7.1.1 Air Quality

The geographic area affected by the project and its potential to contribute to cumulative impacts varies based on the environmental resource under consideration. For air quality, the geographic scope for the project's cumulative impact analysis encompasses the Air Basin.

Based on SCAQMD guidance, individual construction projects that exceed SCAQMD's recommended daily thresholds for project-specific impacts would cause a cumulatively considerable increase in emissions for those pollutants for which the Air Basin is in non-attainment, as discussed below (SCAQMD 2003a):

> *As Lead Agency, the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR… Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant.*

Therefore, consistent with the accepted and established SCAQMD cumulative impact evaluation methodologies, the project's construction or operation emissions would be considered cumulatively considerable if project-specific emissions exceed an applicable SCAQMD-recommended significance threshold.

As previously analyzed, the project would be consistent with the SCAQMD's AQMP during both project construction and operation (Impact AQ-1), and the project would not result in a cumulatively

considerable net increase of criteria pollutants that would exceed applicable SCAQMD thresholds during either construction or operation (Impact AQ-2). In addition, the project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people during either project construction or operation (Impact AQ-4). Therefore, and consistent with SCAQMD guidance, the project would not contribute significantly to cumulative impacts associated with these issues.

However, the project's toxic air contamination HRA determined the project could expose sensitive residential receptors to substantial pollutant concentrations during construction related to diesel exhaust emissions (Impact AQ-3). Given the construction and diesel exhaust emissions that could occur in the vicinity of the project concurrent with project construction, prior to mitigation, this impact could be considered both a direct impact and a contribution to cumulative impacts related to diesel emissions.

In summary, for most of the threshold issue areas for the topic of air quality, the project would not contribute significantly to cumulative impacts. However, regarding toxic air contamination, the HRA determined that the project could contribute significantly to pollutant concentrations during construction (Impact AQ-3). Prior to mitigation, this contribution would be both a significant direct impact of the project as well as a potentially significant contribution to cumulative toxic air contamination in the vicinity of the project. The project's air pollutant emissions related to diesel exhaust during construction could result in a cumulative contribution to air pollution in the region, which would be *significant*. Operation of the project would not result in a significant contribution to air pollution in the region.

With implementation of Mitigation Measure MM-AQ-1, the estimated cancer risk during project construction would be reduced below the SCAQMD threshold of 10 in 1 million. Therefore, potential impacts to sensitive receptors associated with construction of the project would be less than significant with mitigation. As such, and consistent with SCAQMD guidance, after implementation of the mitigation measure, the project's contribution to diesel emissions would be less than significant both individually and cumulatively.

7.1.2 Greenhouse Gas Emissions

The geographic scope considered in the cumulative impact analysis for GHG emissions is global. Adverse environmental impacts of cumulative GHG emissions, including sea level rise, increased average temperatures, more drought years, and more large forest fires, are already occurring. As a result, cumulative impacts related to GHG emissions are significant.

The analysis of a project's GHG emissions is inherently a cumulative impact analysis because impacts of climate change are experienced on a global scale regardless of the location of GHG emission sources. The GHG emissions from an individual development project are not typically going to have a noticeable impact on the global climate, but individual projects contribute to the significant cumulative problem of global warming and climate change. As the California Supreme Court has indicated, "an individual project's emissions will most likely not have any appreciable impact on the global problem by themselves, but they will contribute to the significant impact caused by greenhouse gas emissions from other sources around the globe. The question therefore becomes whether the project's incremental addition of greenhouse gases is "cumulatively considerable" in light of the global problem" (Cleveland National Forest Foundation v. San Diego Association of Governments 2017:14).

Consistent with the inherent consideration of GHG emissions as a cumulative contribution to a global environmental condition, the analysis presented previously considers the potential for the project to contribute considerably to the cumulative impact of global climate change.

The analysis provided in the previous sections demonstrates that the project includes many design features that support the reduction of GHG emissions, including features that would reduce the project's energy consumption, reduce water consumption, and encourage energy conservation, as well as provide visitors with public transportation incentives, the ability to access nearby public transit, and opportunities for walking and biking. However, it has also been determined that, without additional measures, the project may be inconsistent with SCAG's goals related to improving mobility and accessibility, transportation productivity, and encouraging active transportation. This is because the project does not include transportation improvements to encourage and improve active transportation and public transit outside of on-site access and circulation improvements. Also, since detailed design plans have not been developed for the project at this stage, it is also not known whether natural gas use would be included in the final design. As a fossil fuel, natural gas production and use are significant contributors to GHG emissions. For the building sector to achieve carbon neutrality, natural gas usage will need to be phased out and replaced with electricity usage, and electrical generation will need to shift to 100% carbon-free sources. Thus, without mitigation, the project could cause a *significant* contribution to the cumulative impact of GHG emissions and global climate change. With implementation of the identified mitigation measures in Section 7.2, below, impacts would be less than significant.

7.2 Mitigation Measures

7.2.1 Construction

MM-AQ-1: To reduce the potential for health risks as a result of construction of the project, the following measures shall be implemented:

- Prior to the start of construction activities, it shall be ensured that all 75 horsepower or greater diesel-powered equipment are powered with CARB certified Tier 4 Interim engines, except where the County establishes that Tier 4 Interim equipment is not available.

There are several other SCAQMD rules and regulations that serve as mitigation measures for the project construction. These rules are:

- SCAQMD Rule 403, which requires projects to incorporate fugitive dust control measures;
- SCAQMD Rule 1113, which limits the volatile organic compound content of architectural coating; and
- SCAQMD Regulation XIII, New Source Review, which requires new on-site facility nitrogen oxide emissions to be minimized through the use of emission control measures (e.g., use of best available technology control technology for new combustion sources such as boilers and water heaters).

Based on the above analysis, the project's impact would be less than significant, with the measures identified above.

7.2.2 Operation

MM-GHG-1: The modifications to the George C. Page Museum and the development of the new museum shall not include the installation of natural gas infrastructure. Future operation of the new facilities shall not use natural gas–fired appliances. In addition, the project shall provide more electric vehicle charging stations than the mandatory requirements in the Los Angeles County Code, Title 31,

Green Building Standards, electric vehicle charging space and charging station calculations (Code Section 5.106.5.3.3).

MM-GHG-2: In consultation with the LADOT, the Los Angeles County Museum of Natural History Foundation (Foundation) shall prepare and implement a Transportation Demand Management program to reduce museum employee and visitor vehicle trips and increase alternative modes such as walking, bicycling, public transit, and rideshare.

The Foundation shall designate an existing member of staff as the on-site Transportation Demand Management Coordinator. This coordinator shall be responsible for monitoring and tracking employee and visitor mode share and annual reporting to LADOT.

Employee Strategies:

Information shall be distributed to employees and displayed on a bulletin board, display case, or kiosk (displaying transportation information) where the greatest number of employees are likely to see it. The following measures may be applied to reduce employee vehicle trips and VMT:

- Provide a transportation information bulletin board on-site with public transit information, contact information for rideshare and transit, ridesharing promotional material, bike route and facility information, and listing of on-site services or facilities.
- Provide facilities on-site to support bicycling to work, such as secure bike parking, showers, and lockers.
- Encourage and support participation in the Los Angeles County Metropolitan Transportation Authority (Metro) vanpool, including subsidies for participation.
- Implement paid parking for employees.
- Subsidize transit passes.
- Offer flexible work schedules and telecommuting, when feasible.

Visitor Strategies:

Transportation information for visitors shall be displayed on La Brea Tar Pit's website and distributed with physical marketing materials. The following measures may be applied to reduce visitor vehicle trips and VMT:

- Advertise and offer discounted museum tickets for visitors who use public transit or a bicycle to visit the project.
- Provide and maintain secure on-site bicycle parking for visitors and monitor usage to determine if additional bicycle racks are needed.
    - Provide wayfinding signage directing bicyclists from the visitor entrances to where on-site bicycle parking is located.
    - Ensure bicycle parking is well lit and monitored by staff.
- Continue to have paid parking for visitors.
- Coordinate with Metro to improve transit access and user comfort and encourage visitors to take local bus service or the future Purple Line extension to La Brea Tar Pits, through the following measures:
    - Improve pedestrian wayfinding between the planned Purple Line station, local bus stops, and La Brea Tar Pits.

  - Implement bus stop improvements such as bus stop shelters along Wilshire Boulevard that would be used by La Brea Tar Pits visitors.
  - Coordinate with Metro and the City of Los Angeles to ensure that safe and comfortable pedestrian facilities (such as ADA curb ramps and continental crosswalks) are available between local bus stops and the project entrances, including at the Curson Avenue/Wilshire Boulevard intersection.
- Coordinate with the City of Los Angeles to implement planned bikeways in the vicinity of the project site and contribute to the implementation of the bikeways. This includes planned bikeways along Wilshire Boulevard and West 6th Street.

Implementation of these mitigation measures would encourage employees and visitors to reduce their vehicle trips and contribute to VMT and GHG reduction goals. These measures also support multimodal connectivity in the study area. With the implementation of these measures, GHG impacts would be reduced to less than significant with mitigation.

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APPENDIX A

CalEEMod Results
Air Pollutant and Greenhouse Gas Emission Calculations

La Brea Tar Pits Project v3 Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	La Brea Tar Pits Project v3
Construction Start Date	1/1/2024
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50
Precipitation (days)	18.4
Location	5801 Wilshire Blvd, Los Angeles, CA 90036, USA
County	Los Angeles-South Coast
City	Los Angeles
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	4317
EDFZ	16
Electric Utility	Los Angeles Department of Water & Power
Gas Utility	Southern California Gas
App Version	2022.1.1.18

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Other Non-Asphalt Surfaces	140	1000sqft	3.21	0.00	0.00	0.00	—	—
Parking Lot	81.0	1000sqft	1.86	0.00	0.00	0.00	—	—
Library	64.0	1000sqft	1.47	64,000	0.00	0.00	—	—
Library	40.0	1000sqft	0.92	40,000	0.00	0.00	—	—
Library	2.00	1000sqft	0.05	2,000	0.00	0.00	—	—
City Park	6.00	Acre	6.00	0.00	6.00	6.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-B	Water Active Demolition Sites
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.26	9.51	57.1	55.8	0.08	2.46	21.6	24.0	2.26	9.44	11.7	—	9,545	9,545	0.39	0.28	12.7	9,614
Mit.	1.98	8.96	24.4	48.3	0.08	0.27	8.74	9.01	0.26	3.81	4.07	—	9,545	9,545	0.39	0.28	12.7	9,614
% Reduced	73%	6%	57%	13%	—	89%	59%	62%	88%	60%	65%	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.26	6.09	57.1	54.9	0.11	2.46	21.6	24.0	2.26	9.44	11.7	—	15,475	15,475	0.73	1.35	0.58	15,895
Mit.	1.96	1.66	29.6	47.5	0.11	0.28	8.74	9.01	0.27	3.81	4.07	—	15,475	15,475	0.73	1.35	0.58	15,895
% Reduced	73%	73%	48%	14%	—	89%	59%	62%	88%	60%	65%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.94	4.94	47.4	45.2	0.07	1.98	17.3	19.3	1.83	7.42	9.24	—	9,031	9,031	0.39	0.32	4.72	9,140
Mit.	1.58	2.78	21.8	40.6	0.07	0.23	7.23	7.47	0.23	3.05	3.28	—	9,031	9,031	0.39	0.32	4.72	9,140
% Reduced	73%	44%	54%	10%	—	88%	58%	61%	88%	59%	65%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.08	0.90	8.66	8.24	0.01	0.36	3.16	3.52	0.33	1.35	1.69	—	1,495	1,495	0.06	0.05	0.78	1,513
Mit.	0.29	0.51	3.98	7.41	0.01	0.04	1.32	1.36	0.04	0.56	0.60	—	1,495	1,495	0.06	0.05	0.78	1,513
% Reduced	73%	44%	54%	10%	—	88%	58%	61%	88%	59%	65%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	7.26	6.10	57.1	55.8	0.08	2.46	21.6	24.0	2.26	9.44	11.7	—	9,545	9,545	0.39	0.18	5.26	9,614
2025	2.45	2.07	13.1	28.2	0.03	0.47	4.36	4.83	0.43	0.84	1.26	—	6,372	6,372	0.27	0.27	12.7	6,471
2026	2.53	9.51	13.6	29.9	0.03	0.44	6.10	6.54	0.40	1.04	1.45	—	6,751	6,751	0.29	0.28	12.6	6,855
2027	3.00	2.55	17.9	35.8	0.04	0.63	6.03	6.66	0.58	1.03	1.60	—	7,752	7,752	0.33	0.28	11.3	7,856

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	7.26	6.09	57.1	54.9	0.11	2.46	21.6	24.0	2.26	9.44	11.7	—	15,475	15,475	0.73	1.35	0.58	15,895
2025	2.44	2.06	13.3	26.1	0.03	0.47	4.36	4.83	0.43	0.84	1.26	—	6,228	6,228	0.28	0.27	0.33	6,317
2026	2.25	1.88	12.5	25.2	0.03	0.41	4.36	4.77	0.38	0.84	1.21	—	6,157	6,157	0.27	0.27	0.30	6,244
2027	2.16	1.81	12.0	24.3	0.03	0.36	4.36	4.73	0.34	0.84	1.17	—	6,088	6,088	0.19	0.26	0.28	6,172
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	5.94	4.94	47.4	45.2	0.07	1.98	17.3	19.3	1.83	7.42	9.24	—	9,031	9,031	0.39	0.32	3.01	9,140
2025	2.09	1.76	11.5	22.9	0.03	0.40	3.65	4.05	0.36	0.70	1.07	—	5,371	5,371	0.24	0.23	4.72	5,451
2026	1.99	3.26	11.1	22.6	0.03	0.36	4.01	4.36	0.33	0.75	1.07	—	5,406	5,406	0.24	0.23	4.42	5,485
2027	1.50	1.27	9.07	17.2	0.02	0.31	2.92	3.23	0.29	0.50	0.79	—	3,815	3,815	0.12	0.14	2.42	3,862
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.08	0.90	8.66	8.24	0.01	0.36	3.16	3.52	0.33	1.35	1.69	—	1,495	1,495	0.06	0.05	0.50	1,513
2025	0.38	0.32	2.09	4.18	0.01	0.07	0.67	0.74	0.07	0.13	0.19	—	889	889	0.04	0.04	0.78	902
2026	0.36	0.60	2.02	4.13	0.01	0.07	0.73	0.80	0.06	0.14	0.20	—	895	895	0.04	0.04	0.73	908
2027	0.27	0.23	1.66	3.13	< 0.005	0.06	0.53	0.59	0.05	0.09	0.14	—	632	632	0.02	0.02	0.40	639

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.82	1.66	24.4	48.3	0.08	0.27	8.74	9.01	0.26	3.81	4.07	—	9,545	9,545	0.39	0.18	5.26	9,614
2025	1.68	1.47	11.8	30.4	0.03	0.13	3.26	3.39	0.12	0.73	0.85	—	6,372	6,372	0.27	0.27	12.7	6,471
2026	1.81	8.96	12.9	32.2	0.03	0.15	3.89	4.05	0.14	0.82	0.97	—	6,751	6,751	0.29	0.28	12.6	6,855
2027	1.98	1.76	17.4	38.6	0.04	0.20	3.83	4.02	0.19	0.81	0.99	—	7,752	7,752	0.33	0.28	11.3	7,856

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.96	1.66	29.6	47.5	0.11	0.28	8.74	9.01	0.27	3.81	4.07	—	15,475	15,475	0.73	1.35	0.58	15,895
2025	1.67	1.46	12.0	28.3	0.03	0.13	3.26	3.39	0.12	0.73	0.85	—	6,228	6,228	0.28	0.27	0.33	6,317
2026	1.53	1.33	11.8	27.5	0.03	0.12	3.26	3.39	0.11	0.73	0.84	—	6,157	6,157	0.27	0.27	0.30	6,244
2027	1.48	1.28	11.7	26.6	0.03	0.11	3.26	3.37	0.11	0.73	0.83	—	6,088	6,088	0.19	0.26	0.28	6,172
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.58	1.40	21.8	40.6	0.07	0.23	7.23	7.47	0.23	3.05	3.28	—	9,031	9,031	0.39	0.32	3.01	9,140
2025	1.43	1.25	10.3	24.8	0.03	0.11	2.75	2.86	0.10	0.61	0.72	—	5,371	5,371	0.24	0.23	4.72	5,451
2026	1.37	2.78	10.4	24.6	0.03	0.11	2.88	3.00	0.10	0.63	0.74	—	5,406	5,406	0.24	0.23	4.42	5,485
2027	0.98	0.87	8.83	18.6	0.02	0.10	1.87	1.97	0.09	0.40	0.49	—	3,815	3,815	0.12	0.14	2.42	3,862
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.29	0.26	3.98	7.41	0.01	0.04	1.32	1.36	0.04	0.56	0.60	—	1,495	1,495	0.06	0.05	0.50	1,513
2025	0.26	0.23	1.89	4.52	0.01	0.02	0.50	0.52	0.02	0.11	0.13	—	889	889	0.04	0.04	0.78	902
2026	0.25	0.51	1.91	4.49	0.01	0.02	0.53	0.55	0.02	0.12	0.13	—	895	895	0.04	0.04	0.73	908
2027	0.18	0.16	1.61	3.39	< 0.005	0.02	0.34	0.36	0.02	0.07	0.09	—	632	632	0.02	0.02	0.40	639

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.71	8.60	9.21	43.0	0.11	0.42	8.35	8.77	0.41	2.12	2.53	59.2	15,226	15,285	6.88	0.42	25.2	15,606
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.66	8.55	9.50	40.6	0.11	0.42	8.35	8.77	0.41	2.12	2.53	59.2	14,857	14,916	6.91	0.43	1.05	15,219

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.45	7.44	7.15	35.8	0.10	0.32	7.50	7.82	0.32	1.90	2.22	59.2	13,828	13,887	6.85	0.40	10.1	14,187
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.00	1.36	1.30	6.54	0.02	0.06	1.37	1.43	0.06	0.35	0.41	9.81	2,289	2,299	1.13	0.07	1.68	2,349

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.42	4.98	3.17	37.0	0.09	0.05	8.35	8.40	0.05	2.12	2.17	—	9,001	9,001	0.46	0.37	24.8	9,147
Area	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	5,678	5,678	0.47	0.03	—	5,697
Water	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Waste	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Off-Road	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5
Stationary	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Total	6.71	8.60	9.21	43.0	0.11	0.42	8.35	8.77	0.41	2.12	2.53	59.2	15,226	15,285	6.88	0.42	25.2	15,606
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.37	4.92	3.46	34.6	0.08	0.05	8.35	8.40	0.05	2.12	2.17	—	8,632	8,632	0.48	0.39	0.64	8,760
Area	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	5,678	5,678	0.47	0.03	—	5,697

Water	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Waste	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Off-Road	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5
Stationary	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Total	6.66	8.55	9.50	40.6	0.11	0.42	8.35	8.77	0.41	2.12	2.53	59.2	14,857	14,916	6.91	0.43	1.05	15,219
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	4.84	4.44	3.17	32.1	0.08	0.05	7.50	7.55	0.05	1.90	1.95	—	7,936	7,936	0.43	0.35	9.72	8,061
Area	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	5,678	5,678	0.47	0.03	—	5,697
Water	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Waste	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Off-Road	0.03	0.02	0.21	0.37	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.3	54.3	< 0.005	< 0.005	—	54.5
Stationary	0.25	0.23	0.75	0.83	< 0.005	0.03	—	0.03	0.03	—	0.03	—	117	117	< 0.005	< 0.005	—	118
Total	5.45	7.44	7.15	35.8	0.10	0.32	7.50	7.82	0.32	1.90	2.22	59.2	13,828	13,887	6.85	0.40	10.1	14,187
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.88	0.81	0.58	5.86	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,314	1,314	0.07	0.06	1.61	1,335
Area	—	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.06	0.03	0.55	0.46	< 0.005	0.04	—	0.04	0.04	—	0.04	—	940	940	0.08	< 0.005	—	943
Water	—	—	—	—	—	—	—	—	—	—	—	1.05	7.07	8.12	0.11	< 0.005	—	11.6
Waste	—	—	—	—	—	—	—	—	—	—	—	8.76	0.00	8.76	0.88	0.00	—	30.6
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Off-Road	< 0.005	< 0.005	0.04	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.99	8.99	< 0.005	< 0.005	—	9.02
Stationary	0.05	0.04	0.14	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	19.4	19.4	< 0.005	< 0.005	—	19.5

Total	1.00	1.36	1.30	6.54	0.02	0.06	1.37	1.43	0.06	0.35	0.41	9.81	2,289	2,299	1.13	0.07	1.68	2,349

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.42	4.98	3.17	37.0	0.09	0.05	8.35	8.40	0.05	2.12	2.17	—	9,001	9,001	0.46	0.37	24.8	9,147
Area	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	5,678	5,678	0.47	0.03	—	5,697
Water	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Waste	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Off-Road	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5
Stationary	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Total	6.71	8.60	9.21	43.0	0.11	0.42	8.35	8.77	0.41	2.12	2.53	59.2	15,226	15,285	6.88	0.42	25.2	15,606
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.37	4.92	3.46	34.6	0.08	0.05	8.35	8.40	0.05	2.12	2.17	—	8,632	8,632	0.48	0.39	0.64	8,760
Area	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	5,678	5,678	0.47	0.03	—	5,697
Water	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Waste	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Off-Road	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5

Stationary	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Total	6.66	8.55	9.50	40.6	0.11	0.42	8.35	8.77	0.41	2.12	2.53	59.2	14,857	14,916	6.91	0.43	1.05	15,219
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	4.84	4.44	3.17	32.1	0.08	0.05	7.50	7.55	0.05	1.90	1.95	—	7,936	7,936	0.43	0.35	9.72	8,061
Area	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	5,678	5,678	0.47	0.03	—	5,697
Water	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Waste	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Off-Road	0.03	0.02	0.21	0.37	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.3	54.3	< 0.005	< 0.005	—	54.5
Stationary	0.25	0.23	0.75	0.83	< 0.005	0.03	—	0.03	0.03	—	0.03	—	117	117	< 0.005	< 0.005	—	118
Total	5.45	7.44	7.15	35.8	0.10	0.32	7.50	7.82	0.32	1.90	2.22	59.2	13,828	13,887	6.85	0.40	10.1	14,187
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.88	0.81	0.58	5.86	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,314	1,314	0.07	0.06	1.61	1,335
Area	—	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.06	0.03	0.55	0.46	< 0.005	0.04	—	0.04	0.04	—	0.04	—	940	940	0.08	< 0.005	—	943
Water	—	—	—	—	—	—	—	—	—	—	—	1.05	7.07	8.12	0.11	< 0.005	—	11.6
Waste	—	—	—	—	—	—	—	—	—	—	—	8.76	0.00	8.76	0.88	0.00	—	30.6
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Off-Road	< 0.005	< 0.005	0.04	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.99	8.99	< 0.005	< 0.005	—	9.02
Stationary	0.05	0.04	0.14	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	19.4	19.4	< 0.005	< 0.005	—	19.5
Total	1.00	1.36	1.30	6.54	0.02	0.06	1.37	1.43	0.06	0.35	0.41	9.81	2,289	2,299	1.13	0.07	1.68	2,349

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.07	2.58	24.6	21.4	0.03	1.05	—	1.05	0.97	—	0.97	—	3,372	3,372	0.14	0.03	—	3,384
Demolition	—	—	—	—	—	—	0.37	0.37	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.17	5.17	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.07	2.58	24.6	21.4	0.03	1.05	—	1.05	0.97	—	0.97	—	3,372	3,372	0.14	0.03	—	3,384
Demolition	—	—	—	—	—	—	0.37	0.37	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.19	5.19	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.21	1.85	17.6	15.3	0.02	0.75	—	0.75	0.69	—	0.69	—	2,421	2,421	0.10	0.02	—	2,429
Demolition	—	—	—	—	—	—	0.26	0.26	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	1.00	1.00	< 0.005	0.10	0.10	—	3.72	3.72	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.40	0.34	3.22	2.80	< 0.005	0.14	—	0.14	0.13	—	0.13	—	401	401	0.02	< 0.005	—	402
Demolition	—	—	—	—	—	—	0.05	0.05	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.18	0.18	< 0.005	0.02	0.02	—	0.62	0.62	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.22	0.24	3.77	0.00	0.00	0.65	0.65	0.00	0.15	0.15	—	706	706	0.03	0.02	2.78	—
Vendor	0.02	0.01	0.30	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	258	258	0.01	0.04	0.70	—
Hauling	0.02	0.01	0.35	0.14	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	282	282	0.02	0.05	0.65	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.22	0.28	3.19	0.00	0.00	0.65	0.65	0.00	0.15	0.15	—	669	669	0.03	0.02	0.07	—
Vendor	0.02	0.01	0.32	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	258	258	0.01	0.04	0.02	—
Hauling	0.02	0.01	0.37	0.14	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	282	282	0.02	0.05	0.02	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.16	0.20	2.41	0.00	0.00	0.46	0.46	0.00	0.11	0.11	—	487	487	0.02	0.02	0.86	—
Vendor	0.01	0.01	0.23	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	185	185	0.01	0.03	0.22	—
Hauling	0.02	< 0.005	0.27	0.10	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	202	202	0.01	0.03	0.20	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.04	0.44	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	80.7	80.7	< 0.005	< 0.005	0.14	—
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.7	30.7	< 0.005	< 0.005	0.04	—
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.5	33.5	< 0.005	0.01	0.03	—

3.2. Demolition (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.87	0.77	10.5	18.0	0.03	0.18	—	0.18	0.17	—	0.17	—	3,372	3,372	0.14	0.03	—	3,384
Demolition	—	—	—	—	—	—	0.23	0.23	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.17	5.17	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.87	0.77	10.5	18.0	0.03	0.18	—	0.18	0.17	—	0.17	—	3,372	3,372	0.14	0.03	—	3,384
Demolition	—	—	—	—	—	—	0.23	0.23	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.19	5.19	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	0.56	7.53	12.9	0.02	0.13	—	0.13	0.12	—	0.12	—	2,421	2,421	0.10	0.02	—	2,429
Demolition	—	—	—	—	—	—	0.17	0.17	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.25	0.25	< 0.005	0.03	0.03	—	3.72	3.72	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.10	1.37	2.36	< 0.005	0.02	—	0.02	0.02	—	0.02	—	401	401	0.02	< 0.005	—	402
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	—	0.62	0.62	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.22	0.24	3.77	0.00	0.00	0.65	0.65	0.00	0.15	0.15	—	706	706	0.03	0.02	2.78	—
Vendor	0.02	0.01	0.30	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	258	258	0.01	0.04	0.70	—
Hauling	0.02	0.01	0.35	0.14	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	282	282	0.02	0.05	0.65	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.22	0.28	3.19	0.00	0.00	0.65	0.65	0.00	0.15	0.15	—	669	669	0.03	0.02	0.07	—
Vendor	0.02	0.01	0.32	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	258	258	0.01	0.04	0.02	—
Hauling	0.02	0.01	0.37	0.14	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	282	282	0.02	0.05	0.02	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.16	0.20	2.41	0.00	0.00	0.46	0.46	0.00	0.11	0.11	—	487	487	0.02	0.02	0.86	—
Vendor	0.01	0.01	0.23	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	185	185	0.01	0.03	0.22	—
Hauling	0.02	< 0.005	0.27	0.10	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	202	202	0.01	0.03	0.20	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.04	0.44	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	80.7	80.7	< 0.005	< 0.005	0.14	—
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.7	30.7	< 0.005	< 0.005	0.04	—
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.5	33.5	< 0.005	0.01	0.03	—

3.3. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.19	31.5	28.8	0.04	1.40	—	1.40	1.29	—	1.29	—	4,634	4,634	0.19	0.04	—	4,650
Dust From Material Movement	—	—	—	—	—	—	17.2	17.2	—	8.84	8.84	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.17	5.17	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.19	31.5	28.8	0.04	1.40	—	1.40	1.29	—	1.29	—	4,634	4,634	0.19	0.04	—	4,650
Dust From Material Movement	—	—	—	—	—	—	17.2	17.2	—	8.84	8.84	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.19	5.19	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.72	2.29	22.6	20.7	0.03	1.00	—	1.00	0.92	—	0.92	—	3,326	3,326	0.13	0.03	—	3,338
Dust From Material Movement	—	—	—	—	—	—	12.3	12.3	—	6.35	6.35	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	1.00	1.00	< 0.005	0.10	0.10	—	3.72	3.72	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.50	0.42	4.12	3.77	0.01	0.18	—	0.18	0.17	—	0.17	—	551	551	0.02	< 0.005	—	553

Dust From Material Movement	—	—	—	—	—	—	2.25	2.25	—	1.16	1.16	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.18	0.18	< 0.005	0.02	0.02	—	0.62	0.62	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.10	1.51	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.11	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.11	1.28	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	268	268	0.01	0.01	0.03	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.08	0.96	0.00	0.00	0.19	0.19	0.00	0.04	0.04	—	195	195	0.01	0.01	0.34	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	32.3	32.3	< 0.005	< 0.005	0.06	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.4. Site Preparation (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	0.56	12.9	24.8	0.04	0.09	—	0.09	0.09	—	0.09	—	4,634	4,634	0.19	0.04	—	4,650
Dust From Material Movement	—	—	—	—	—	—	6.71	6.71	—	3.45	3.45	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.17	5.17	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	0.56	12.9	24.8	0.04	0.09	—	0.09	0.09	—	0.09	—	4,634	4,634	0.19	0.04	—	4,650
Dust From Material Movement	—	—	—	—	—	—	6.71	6.71	—	3.45	3.45	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.19	5.19	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.40	0.40	9.25	17.8	0.03	0.06	—	0.06	0.06	—	0.06	—	3,326	3,326	0.13	0.03	—	3,338
Dust From Material Movement	—	—	—	—	—	—	4.82	4.82	—	2.47	2.47	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.25	0.25	< 0.005	0.03	0.03	—	3.72	3.72	< 0.005	< 0.005	< 0.005	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.07	1.69	3.24	0.01	0.01	—	0.01	0.01	—	0.01	—	551	551	0.02	< 0.005	—	553
Dust From Material Movement	—	—	—	—	—	—	0.88	0.88	—	0.45	0.45	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	—	0.62	0.62	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.10	1.51	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.11	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.11	1.28	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	268	268	0.01	0.01	0.03	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.08	0.96	0.00	0.00	0.19	0.19	0.00	0.04	0.04	—	195	195	0.01	0.01	0.34	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	32.3	32.3	< 0.005	< 0.005	0.06	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.5. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	9.21	9.21	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.19	5.19	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.60	0.50	4.88	4.30	0.01	0.21	—	0.21	0.19	—	0.19	—	940	940	0.04	0.01	—	943
Dust From Material Movement	—	—	—	—	—	—	1.31	1.31	—	0.52	0.52	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.20	0.20	< 0.005	0.02	0.02	—	0.74	0.74	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.89	0.78	< 0.005	0.04	—	0.04	0.03	—	0.03	—	156	156	0.01	< 0.005	—	156

Dust From Material Movement	—	—	—	—	—	—	0.24	0.24	—	0.10	0.10	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	0.12	0.12	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.37	0.33	0.42	4.78	0.00	0.00	0.98	0.98	0.00	0.23	0.23	—	1,004	1,004	0.05	0.04	0.11	—
Vendor	0.03	0.01	0.39	0.19	< 0.005	< 0.005	0.09	0.09	< 0.005	0.02	0.03	—	323	323	0.01	0.04	0.02	—
Hauling	0.57	0.16	9.79	3.62	0.05	0.09	1.98	2.08	0.09	0.54	0.64	—	7,545	7,545	0.41	1.21	0.45	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.06	0.72	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	145	145	0.01	0.01	0.26	—
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	46.0	46.0	< 0.005	0.01	0.05	—
Hauling	0.08	0.02	1.42	0.51	0.01	0.01	0.28	0.29	0.01	0.08	0.09	—	1,075	1,075	0.06	0.17	1.07	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.13	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	24.0	24.0	< 0.005	< 0.005	0.04	—
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.61	7.61	< 0.005	< 0.005	0.01	—
Hauling	0.01	< 0.005	0.26	0.09	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	178	178	0.01	0.03	0.18	—

3.6. Grading (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.00	0.96	18.9	35.4	0.06	0.18	—	0.18	0.17	—	0.17	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.43	1.43	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.19	5.19	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.14	2.70	5.04	0.01	0.03	—	0.03	0.02	—	0.02	—	940	940	0.04	0.01	—	943
Dust From Material Movement	—	—	—	—	—	—	0.51	0.51	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	0.74	0.74	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.49	0.92	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	156	156	0.01	< 0.005	—	156
Dust From Material Movement	—	—	—	—	—	—	0.09	0.09	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.12	0.12	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.37	0.33	0.42	4.78	0.00	0.00	0.98	0.98	0.00	0.23	0.23	—	1,004	1,004	0.05	0.04	0.11	—
Vendor	0.03	0.01	0.39	0.19	< 0.005	< 0.005	0.09	0.09	< 0.005	0.02	0.03	—	323	323	0.01	0.04	0.02	—
Hauling	0.57	0.16	9.79	3.62	0.05	0.09	1.98	2.08	0.09	0.54	0.64	—	7,545	7,545	0.41	1.21	0.45	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.06	0.72	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	145	145	0.01	0.01	0.26	—
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	46.0	46.0	< 0.005	0.01	0.05	—
Hauling	0.08	0.02	1.42	0.51	0.01	0.01	0.28	0.29	0.01	0.08	0.09	—	1,075	1,075	0.06	0.17	1.07	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.13	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	24.0	24.0	< 0.005	< 0.005	0.04	—
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.61	7.61	< 0.005	< 0.005	0.01	—
Hauling	0.01	< 0.005	0.26	0.09	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	178	178	0.01	0.03	0.18	—

3.7. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.42	1.19	11.0	13.8	0.03	0.45	—	0.45	0.42	—	0.42	—	2,573	2,573	0.10	0.02	—	2,582

Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.08	5.08	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.42	1.19	11.0	13.8	0.03	0.45	—	0.45	0.42	—	0.42	—	2,573	2,573	0.10	0.02	—	2,582
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.11	5.11	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.21	1.02	9.46	11.8	0.02	0.39	—	0.39	0.36	—	0.36	—	2,206	2,206	0.09	0.02	—	2,213
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.20	1.20	< 0.005	0.12	0.12	—	4.36	4.36	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.19	1.73	2.15	< 0.005	0.07	—	0.07	0.07	—	0.07	—	365	365	0.01	< 0.005	—	366
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.22	0.22	< 0.005	0.02	0.02	—	0.72	0.72	< 0.005	< 0.005	< 0.005	—

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.96	0.86	0.87	13.9	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,765	2,765	0.12	0.09	10.1	—
Vendor	0.04	0.02	0.63	0.31	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	551	551	0.02	0.08	1.51	—
Hauling	0.04	0.01	0.59	0.23	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	477	477	0.03	0.07	1.11	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.95	0.85	0.96	11.8	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,621	2,621	0.12	0.10	0.26	—
Vendor	0.04	0.02	0.65	0.31	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	551	551	0.02	0.08	0.04	—
Hauling	0.04	0.01	0.61	0.23	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	477	477	0.03	0.07	0.03	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.81	0.72	0.89	10.6	0.00	0.00	2.21	2.21	0.00	0.52	0.52	—	2,280	2,280	0.10	0.08	3.75	—
Vendor	0.03	0.01	0.56	0.26	< 0.005	0.01	0.13	0.13	< 0.005	0.03	0.04	—	473	473	0.02	0.07	0.56	—
Hauling	0.03	0.01	0.53	0.20	< 0.005	0.01	0.11	0.11	0.01	0.03	0.03	—	409	409	0.02	0.06	0.41	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.16	1.94	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	377	377	0.02	0.01	0.62	—
Vendor	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	78.2	78.2	< 0.005	0.01	0.09	—
Hauling	0.01	< 0.005	0.10	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	67.7	67.7	< 0.005	0.01	0.07	—

3.8. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.64	0.59	9.73	16.0	0.03	0.12	—	0.12	0.11	—	0.11	—	2,573	2,573	0.10	0.02	—	2,582
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.08	5.08	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.59	9.73	16.0	0.03	0.12	—	0.12	0.11	—	0.11	—	2,573	2,573	0.10	0.02	—	2,582
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.11	5.11	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.55	0.50	8.34	13.7	0.02	0.10	—	0.10	0.09	—	0.09	—	2,206	2,206	0.09	0.02	—	2,213
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	4.36	4.36	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	1.52	2.50	< 0.005	0.02	—	0.02	0.02	—	0.02	—	365	365	0.01	< 0.005	—	366
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	0.72	0.72	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.96	0.86	0.87	13.9	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,765	2,765	0.12	0.09	10.1	—
Vendor	0.04	0.02	0.63	0.31	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	551	551	0.02	0.08	1.51	—
Hauling	0.04	0.01	0.59	0.23	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	477	477	0.03	0.07	1.11	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.95	0.85	0.96	11.8	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,621	2,621	0.12	0.10	0.26	—
Vendor	0.04	0.02	0.65	0.31	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	551	551	0.02	0.08	0.04	—
Hauling	0.04	0.01	0.61	0.23	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	477	477	0.03	0.07	0.03	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.81	0.72	0.89	10.6	0.00	0.00	2.21	2.21	0.00	0.52	0.52	—	2,280	2,280	0.10	0.08	3.75	—
Vendor	0.03	0.01	0.56	0.26	< 0.005	0.01	0.13	0.13	< 0.005	0.03	0.04	—	473	473	0.02	0.07	0.56	—
Hauling	0.03	0.01	0.53	0.20	< 0.005	0.01	0.11	0.11	0.01	0.03	0.03	—	409	409	0.02	0.06	0.41	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.16	1.94	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	377	377	0.02	0.01	0.62	—
Vendor	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	78.2	78.2	< 0.005	0.01	0.09	—
Hauling	0.01	< 0.005	0.10	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	67.7	67.7	< 0.005	0.01	0.07	—

3.9. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.7	0.03	0.40	—	0.40	0.37	—	0.37	—	2,573	2,573	0.10	0.02	—	2,582
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	4.99	4.99	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.7	0.03	0.40	—	0.40	0.37	—	0.37	—	2,573	2,573	0.10	0.02	—	2,582
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	5.02	5.02	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.16	0.97	8.93	11.7	0.02	0.34	—	0.34	0.31	—	0.31	—	2,205	2,205	0.09	0.02	—	2,213
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.20	1.20	< 0.005	0.12	0.12	—	4.29	4.29	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.18	1.63	2.14	< 0.005	0.06	—	0.06	0.06	—	0.06	—	365	365	0.01	< 0.005	—	366

Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.22	0.22	< 0.005	0.02	0.02	—	0.71	0.71	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.83	0.74	0.78	12.9	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,710	2,710	0.11	0.09	9.17	—
Vendor	0.04	0.02	0.60	0.29	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	542	542	0.02	0.08	1.46	—
Hauling	0.03	0.01	0.56	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	468	468	0.03	0.07	1.05	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.83	0.73	0.87	11.0	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,569	2,569	0.12	0.09	0.24	—
Vendor	0.04	0.02	0.62	0.30	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	542	542	0.02	0.08	0.04	—
Hauling	0.03	0.01	0.59	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	469	469	0.03	0.07	0.03	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.71	0.62	0.81	9.89	0.00	0.00	2.21	2.21	0.00	0.52	0.52	—	2,234	2,234	0.10	0.08	3.40	—
Vendor	0.03	0.01	0.54	0.25	< 0.005	0.01	0.13	0.13	< 0.005	0.03	0.04	—	464	464	0.02	0.07	0.54	—
Hauling	0.03	0.01	0.51	0.19	< 0.005	0.01	0.11	0.11	0.01	0.03	0.03	—	401	401	0.02	0.06	0.39	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.11	0.15	1.80	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	370	370	0.02	0.01	0.56	—
Vendor	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	76.9	76.9	< 0.005	0.01	0.09	—
Hauling	0.01	< 0.005	0.09	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	66.5	66.5	< 0.005	0.01	0.06	—

3.10. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.63	0.57	9.68	15.9	0.03	0.11	—	0.11	0.10	—	0.10	—	2,573	2,573	0.10	0.02	—	2,582
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	4.99	4.99	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.63	0.57	9.68	15.9	0.03	0.11	—	0.11	0.10	—	0.10	—	2,573	2,573	0.10	0.02	—	2,582
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	5.02	5.02	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54	0.49	8.30	13.7	0.02	0.09	—	0.09	0.09	—	0.09	—	2,205	2,205	0.09	0.02	—	2,213
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	4.29	4.29	< 0.005	< 0.005	< 0.005	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	1.51	2.49	< 0.005	0.02	—	0.02	0.02	—	0.02	—	365	365	0.01	< 0.005	—	366
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	0.71	0.71	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.83	0.74	0.78	12.9	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,710	2,710	0.11	0.09	9.17	—
Vendor	0.04	0.02	0.60	0.29	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	542	542	0.02	0.08	1.46	—
Hauling	0.03	0.01	0.56	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	468	468	0.03	0.07	1.05	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.83	0.73	0.87	11.0	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,569	2,569	0.12	0.09	0.24	—
Vendor	0.04	0.02	0.62	0.30	< 0.005	0.01	0.15	0.16	< 0.005	0.04	0.04	—	542	542	0.02	0.08	0.04	—
Hauling	0.03	0.01	0.59	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	469	469	0.03	0.07	0.03	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.71	0.62	0.81	9.89	0.00	0.00	2.21	2.21	0.00	0.52	0.52	—	2,234	2,234	0.10	0.08	3.40	—
Vendor	0.03	0.01	0.54	0.25	< 0.005	0.01	0.13	0.13	< 0.005	0.03	0.04	—	464	464	0.02	0.07	0.54	—
Hauling	0.03	0.01	0.51	0.19	< 0.005	0.01	0.11	0.11	0.01	0.03	0.03	—	401	401	0.02	0.06	0.39	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.11	0.15	1.80	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	370	370	0.02	0.01	0.56	—
Vendor	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	76.9	76.9	< 0.005	0.01	0.09	—
Hauling	0.01	< 0.005	0.09	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	66.5	66.5	< 0.005	0.01	0.06	—

3.11. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.30	1.09	9.94	13.6	0.03	0.35	—	0.35	0.33	—	0.33	—	2,573	2,573	0.10	0.02	—	2,581
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	4.90	4.90	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.30	1.09	9.94	13.6	0.03	0.35	—	0.35	0.33	—	0.33	—	2,573	2,573	0.10	0.02	—	2,581
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	4.93	4.93	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	0.54	4.95	6.80	0.01	0.18	—	0.18	0.16	—	0.16	—	1,281	1,281	0.05	0.01	—	1,285
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.70	0.70	< 0.005	0.07	0.07	—	2.45	2.45	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.90	1.24	< 0.005	0.03	—	0.03	0.03	—	0.03	—	212	212	0.01	< 0.005	—	213
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.13	0.13	< 0.005	0.01	0.01	—	0.40	0.40	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.80	0.71	0.69	12.0	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,658	2,658	0.11	0.09	8.28	—
Vendor	0.03	0.02	0.57	0.27	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	531	531	0.02	0.07	1.39	—
Hauling	0.03	0.01	0.54	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	459	459	0.02	0.07	0.98	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.80	0.70	0.86	10.2	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,520	2,520	0.04	0.09	0.21	—
Vendor	0.03	0.02	0.59	0.28	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	531	531	0.02	0.07	0.04	—
Hauling	0.03	0.01	0.57	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	459	459	0.02	0.07	0.03	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.40	0.35	0.43	5.33	0.00	0.00	1.29	1.29	0.00	0.30	0.30	—	1,273	1,273	0.02	0.05	1.78	—
Vendor	0.02	0.01	0.30	0.14	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	265	265	0.01	0.04	0.30	—
Hauling	0.02	< 0.005	0.29	0.11	< 0.005	< 0.005	0.06	0.07	< 0.005	0.02	0.02	—	229	229	0.01	0.04	0.21	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.08	0.97	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	211	211	< 0.005	0.01	0.29	—
Vendor	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	43.8	43.8	< 0.005	0.01	0.05	—

Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	37.8	37.8	< 0.005	0.01	0.03	—

3.12. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	0.56	9.64	15.9	0.03	0.10	—	0.10	0.10	—	0.10	—	2,573	2,573	0.10	0.02	—	2,581
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	4.90	4.90	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	0.56	9.64	15.9	0.03	0.10	—	0.10	0.10	—	0.10	—	2,573	2,573	0.10	0.02	—	2,581
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	4.93	4.93	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	0.28	4.80	7.93	0.01	0.05	—	0.05	0.05	—	0.05	—	1,281	1,281	0.05	0.01	—	1,285

Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.18	0.18	< 0.005	0.02	0.02	—	2.45	2.45	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.88	1.45	< 0.005	0.01	—	0.01	0.01	—	0.01	—	212	212	0.01	< 0.005	—	213
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	0.40	0.40	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.80	0.71	0.69	12.0	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,658	2,658	0.11	0.09	8.28	—
Vendor	0.03	0.02	0.57	0.27	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	531	531	0.02	0.07	1.39	—
Hauling	0.03	0.01	0.54	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	459	459	0.02	0.07	0.98	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.80	0.70	0.86	10.2	0.00	0.00	2.61	2.61	0.00	0.61	0.61	—	2,520	2,520	0.04	0.09	0.21	—
Vendor	0.03	0.02	0.59	0.28	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	531	531	0.02	0.07	0.04	—
Hauling	0.03	0.01	0.57	0.22	< 0.005	0.01	0.13	0.13	0.01	0.03	0.04	—	459	459	0.02	0.07	0.03	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.40	0.35	0.43	5.33	0.00	0.00	1.29	1.29	0.00	0.30	0.30	—	1,273	1,273	0.02	0.05	1.78	—
Vendor	0.02	0.01	0.30	0.14	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	265	265	0.01	0.04	0.30	—
Hauling	0.02	< 0.005	0.29	0.11	< 0.005	< 0.005	0.06	0.07	< 0.005	0.02	0.02	—	229	229	0.01	0.04	0.21	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.08	0.97	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	211	211	< 0.005	0.01	0.29	—
Vendor	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	43.8	43.8	< 0.005	0.01	0.05	—
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	37.8	37.8	< 0.005	0.01	0.03	—

3.13. Paving (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.77	0.65	6.08	8.71	0.01	0.26	—	0.26	0.24	—	0.24	—	1,322	1,322	0.05	0.01	—	1,327
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	4.90	4.90	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.77	0.65	6.08	8.71	0.01	0.26	—	0.26	0.24	—	0.24	—	1,322	1,322	0.05	0.01	—	1,327
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	4.93	4.93	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	0.33	3.06	4.39	0.01	0.13	—	0.13	0.12	—	0.12	—	667	667	0.03	0.01	—	669
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.70	0.70	< 0.005	0.07	0.07	—	2.48	2.48	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.56	0.80	< 0.005	0.02	—	0.02	0.02	—	0.02	—	110	110	< 0.005	< 0.005	—	111
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.13	0.13	< 0.005	0.01	0.01	—	0.41	0.41	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.90	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	199	199	0.01	0.01	0.62	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.06	0.76	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	189	189	< 0.005	0.01	0.02	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.40	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	96.7	96.7	< 0.005	< 0.005	0.13	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.0	16.0	< 0.005	< 0.005	0.02	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.14. Paving (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.39	5.89	9.28	0.01	0.08	—	0.08	0.08	—	0.08	—	1,322	1,322	0.05	0.01	—	1,327
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	4.90	4.90	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.39	5.89	9.28	0.01	0.08	—	0.08	0.08	—	0.08	—	1,322	1,322	0.05	0.01	—	1,327
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	4.93	4.93	< 0.005	< 0.005	< 0.005	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.19	2.97	4.68	0.01	0.04	—	0.04	0.04	—	0.04	—	667	667	0.03	0.01	—	669
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.18	0.18	< 0.005	0.02	0.02	—	2.48	2.48	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.04	0.54	0.85	< 0.005	0.01	—	0.01	0.01	—	0.01	—	110	110	< 0.005	< 0.005	—	111
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	0.41	0.41	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.90	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	199	199	0.01	0.01	0.62	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.06	0.76	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	189	189	< 0.005	0.01	0.02	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.40	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	96.7	96.7	< 0.005	< 0.005	0.13	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.0	16.0	< 0.005	< 0.005	0.02	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.15. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	0.16	1.14	1.51	< 0.005	0.03	—	0.03	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179
Architectural Coatings	—	7.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.47	1.47	< 0.005	0.15	0.15	—	4.99	4.99	< 0.005	< 0.005	0.01	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.25	0.33	< 0.005	0.01	—	0.01	0.01	—	0.01	—	38.5	38.5	< 0.005	< 0.005	—	38.7
Architectural Coatings	—	1.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	1.08	1.08	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.38	6.38	< 0.005	< 0.005	—	6.40
Architectural Coatings	—	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	0.18	0.18	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.08	1.29	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	271	271	0.01	0.01	0.92	—

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.25	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	56.4	56.4	< 0.005	< 0.005	0.09	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.34	9.34	< 0.005	< 0.005	0.01	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.16. Architectural Coating (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	0.16	1.14	1.51	< 0.005	0.03	—	0.03	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179
Architectural Coatings	—	7.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.37	0.37	< 0.005	0.04	0.04	—	4.99	4.99	< 0.005	< 0.005	0.01	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.25	0.33	< 0.005	0.01	—	0.01	0.01	—	0.01	—	38.5	38.5	< 0.005	< 0.005	—	38.7
Architectural Coatings	—	1.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	1.08	1.08	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.38	6.38	< 0.005	< 0.005	—	6.40
Architectural Coatings	—	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.18	0.18	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.08	1.29	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	271	271	0.01	0.01	0.92	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.25	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	56.4	56.4	< 0.005	< 0.005	0.09	—

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.34	9.34	< 0.005	< 0.005	0.01	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Library	5.38	4.94	3.15	36.7	0.09	0.05	8.28	8.34	0.05	2.10	2.15	—	8,933	8,933	0.45	0.37	24.6	9,078
City Park	0.04	0.04	0.02	0.28	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	68.7	68.7	< 0.005	< 0.005	0.19	69.8
Total	5.42	4.98	3.17	37.0	0.09	0.05	8.35	8.40	0.05	2.12	2.17	—	9,001	9,001	0.46	0.37	24.8	9,147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Library	5.33	4.89	3.44	34.3	0.08	0.05	8.28	8.34	0.05	2.10	2.15	—	8,566	8,566	0.48	0.38	0.64	8,693
City Park	0.04	0.04	0.03	0.26	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	65.9	65.9	< 0.005	< 0.005	< 0.005	66.8
Total	5.37	4.92	3.46	34.6	0.08	0.05	8.35	8.40	0.05	2.12	2.17	—	8,632	8,632	0.48	0.39	0.64	8,760
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Library	0.88	0.81	0.58	5.83	0.01	0.01	1.36	1.37	0.01	0.35	0.35	—	1,308	1,308	0.07	0.06	1.60	1,329
City Park	< 0.005	< 0.005	< 0.005	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	5.79	5.79	< 0.005	< 0.005	0.01	5.88
Total	0.88	0.81	0.58	5.86	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,314	1,314	0.07	0.06	1.61	1,335

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Library	5.38	4.94	3.15	36.7	0.09	0.05	8.28	8.34	0.05	2.10	2.15	—	8,933	8,933	0.45	0.37	24.6	9,078
City Park	0.04	0.04	0.02	0.28	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	68.7	68.7	< 0.005	< 0.005	0.19	69.8

Total	5.42	4.98	3.17	37.0	0.09	0.05	8.35	8.40	0.05	2.12	2.17	—	9,001	9,001	0.46	0.37	24.8	9,147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Library	5.33	4.89	3.44	34.3	0.08	0.05	8.28	8.34	0.05	2.10	2.15	—	8,566	8,566	0.48	0.38	0.64	8,693
City Park	0.04	0.04	0.03	0.26	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	65.9	65.9	< 0.005	< 0.005	< 0.005	66.8
Total	5.37	4.92	3.46	34.6	0.08	0.05	8.35	8.40	0.05	2.12	2.17	—	8,632	8,632	0.48	0.39	0.64	8,760
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Library	0.88	0.81	0.58	5.83	0.01	0.01	1.36	1.37	0.01	0.35	0.35	—	1,308	1,308	0.07	0.06	1.60	1,329
City Park	< 0.005	< 0.005	< 0.005	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	5.79	5.79	< 0.005	< 0.005	0.01	5.88
Total	0.88	0.81	0.58	5.86	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,314	1,314	0.07	0.06	1.61	1,335

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	134	134	0.01	< 0.005	—	135
Library	—	—	—	—	—	—	—	—	—	—	—	—	1,942	1,942	0.14	0.02	—	1,951
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,076	2,076	0.15	0.02	—	2,086
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	134	134	0.01	< 0.005	—	135
Library	—	—	—	—	—	—	—	—	—	—	—	—	1,942	1,942	0.14	0.02	—	1,951
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,076	2,076	0.15	0.02	—	2,086
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	22.2	22.2	< 0.005	< 0.005	—	22.3
Library	—	—	—	—	—	—	—	—	—	—	—	—	322	322	0.02	< 0.005	—	323
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	344	344	0.02	< 0.005	—	345

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	134	134	0.01	< 0.005	—	135
Library	—	—	—	—	—	—	—	—	—	—	—	—	1,942	1,942	0.14	0.02	—	1,951
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,076	2,076	0.15	0.02	—	2,086
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	134	134	0.01	< 0.005	—	135
Library	—	—	—	—	—	—	—	—	—	—	—	—	1,942	1,942	0.14	0.02	—	1,951
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,076	2,076	0.15	0.02	—	2,086
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	22.2	22.2	< 0.005	< 0.005	—	22.3
Library	—	—	—	—	—	—	—	—	—	—	—	—	322	322	0.02	< 0.005	—	323
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	344	344	0.02	< 0.005	—	345

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Library	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Library	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

Library	0.06	0.03	0.55	0.46	< 0.005	0.04	—	0.04	0.04	—	0.04	—	596	596	0.05	< 0.005	—	598
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.06	0.03	0.55	0.46	< 0.005	0.04	—	0.04	0.04	—	0.04	—	596	596	0.05	< 0.005	—	598

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Library	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Library	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.33	0.17	3.02	2.54	0.02	0.23	—	0.23	0.23	—	0.23	—	3,601	3,601	0.32	0.01	—	3,611
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Library	0.06	0.03	0.55	0.46	< 0.005	0.04	—	0.04	0.04	—	0.04	—	596	596	0.05	< 0.005	—	598
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.06	0.03	0.55	0.46	< 0.005	0.04	—	0.04	0.04	—	0.04	—	596	596	0.05	< 0.005	—	598

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	2.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	2.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	2.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	2.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	2.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005
Total	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005
Total	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	1.05	7.07	8.12	0.11	< 0.005	—	11.6
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005
Total	—	—	—	—	—	—	—	—	—	—	—	1.05	7.07	8.12	0.11	< 0.005	—	11.6

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005
Total	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005
Total	—	—	—	—	—	—	—	—	—	—	—	6.36	42.7	49.1	0.65	0.02	—	70.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	1.05	7.07	8.12	0.11	< 0.005	—	11.6
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005
Total	—	—	—	—	—	—	—	—	—	—	—	1.05	7.07	8.12	0.11	< 0.005	—	11.6

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	52.6	0.00	52.6	5.26	0.00	—	184
City Park	—	—	—	—	—	—	—	—	—	—	—	0.28	0.00	0.28	0.03	0.00	—	0.97
Total	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	52.6	0.00	52.6	5.26	0.00	—	184
City Park	—	—	—	—	—	—	—	—	—	—	—	0.28	0.00	0.28	0.03	0.00	—	0.97
Total	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	8.71	0.00	8.71	0.87	0.00	—	30.5
City Park	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	< 0.005	0.00	—	0.16
Total	—	—	—	—	—	—	—	—	—	—	—	8.76	0.00	8.76	0.88	0.00	—	30.6

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	52.6	0.00	52.6	5.26	0.00	—	184
City Park	—	—	—	—	—	—	—	—	—	—	—	0.28	0.00	0.28	0.03	0.00	—	0.97
Total	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	52.6	0.00	52.6	5.26	0.00	—	184
City Park	—	—	—	—	—	—	—	—	—	—	—	0.28	0.00	0.28	0.03	0.00	—	0.97
Total	—	—	—	—	—	—	—	—	—	—	—	52.9	0.00	52.9	5.29	0.00	—	185
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Library	—	—	—	—	—	—	—	—	—	—	—	8.71	0.00	8.71	0.87	0.00	—	30.5
City Park	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	< 0.005	0.00	—	0.16
Total	—	—	—	—	—	—	—	—	—	—	—	8.76	0.00	8.76	0.88	0.00	—	30.6

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Library	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Library	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Library	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Library	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Library	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.41	0.41
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Library	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76.5
Total	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Forklifts	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76.5
Total	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	< 0.005	< 0.005	0.04	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.99	8.99	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.02
Total	< 0.005	< 0.005	0.04	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.99	8.99	< 0.005	< 0.005	—	9.02

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76.5
Total	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76.5
Total	0.04	0.03	0.29	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	76.2	76.2	< 0.005	< 0.005	—	76.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	< 0.005	< 0.005	0.04	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.99	8.99	< 0.005	< 0.005	—	—

undefine	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.02
Total	< 0.005	< 0.005	0.04	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.99	8.99	< 0.005	< 0.005	—	9.02

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	430
Total	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	430
Total	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Emergency Generato	0.05	0.04	0.14	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	19.4	19.4	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19.5
Total	0.05	0.04	0.14	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	19.4	19.4	< 0.005	< 0.005	—	19.5

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	430
Total	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	430
Total	0.92	0.84	2.73	3.04	< 0.005	0.12	—	0.12	0.12	—	0.12	—	428	428	0.02	< 0.005	—	430
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Emergency	0.05	0.04	0.14	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	19.4	19.4	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19.5
Total	0.05	0.04	0.14	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	19.4	19.4	< 0.005	< 0.005	—	19.5

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Remove d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequest ered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Remove d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description

Demolition	Demolition	1/1/2024	10/31/2024	6.00	262	—
Site Preparation	Site Preparation	1/1/2024	10/31/2024	6.00	262	—
Grading	Grading	11/1/2024	12/31/2024	6.00	52.0	—
Building Construction	Building Construction	1/1/2025	7/31/2027	6.00	808	—
Paving	Paving	6/1/2027	12/31/2027	6.00	184	—
Architectural Coating	Architectural Coating	7/1/2026	9/30/2026	6.00	79.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	7.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	7.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	7.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Average	3.00	7.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	8.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45

Building Construction	Tractors/Loaders/Backh	Diesel	Average	3.00	8.00	84.0	0.37
Paving	Pavers	Diesel	Average	2.00	7.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	7.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	7.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Tier 4 Interim	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	7.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Interim	3.00	7.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	4.00	7.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Interim	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Tier 4 Interim	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Tier 4 Interim	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Tier 4 Interim	3.00	7.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Tier 4 Interim	1.00	8.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	8.00	84.0	0.37
Paving	Pavers	Diesel	Tier 4 Interim	2.00	7.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 4 Interim	2.00	7.00	89.0	0.36

Paving	Rollers	Diesel	Average	2.00	7.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	50.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	8.00	10.2	HHDT,MHDT
Demolition	Hauling	4.00	20.0	HHDT
Demolition	Onsite truck	1.00	1.00	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	0.00	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	1.00	1.00	HHDT
Grading	—	—	—	—
Grading	Worker	75.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	10.0	10.2	HHDT,MHDT
Grading	Hauling	107	20.0	HHDT
Grading	Onsite truck	1.00	1.00	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	200	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	17.4	10.2	HHDT,MHDT
Building Construction	Hauling	6.88	20.0	HHDT
Building Construction	Onsite truck	1.00	1.00	HHDT

Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	0.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	1.00	1.00	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	20.0	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	0.00	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	1.00	1.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	50.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	8.00	10.2	HHDT,MHDT
Demolition	Hauling	4.00	20.0	HHDT
Demolition	Onsite truck	1.00	1.00	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	0.00	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	1.00	1.00	HHDT
Grading	—	—	—	—
Grading	Worker	75.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	10.0	10.2	HHDT,MHDT
Grading	Hauling	107	20.0	HHDT

Grading	Onsite truck	1.00	1.00	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	200	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	17.4	10.2	HHDT,MHDT
Building Construction	Hauling	6.88	20.0	HHDT
Building Construction	Onsite truck	1.00	1.00	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	0.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	1.00	1.00	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	20.0	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	0.00	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	1.00	1.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	168,945	56,315	13,260

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	102,000	—
Site Preparation	0.00	0.00	393	0.00	—
Grading	30,000	14,500	156	0.00	—
Building Construction	6,000	38,500	50.0	0.00	—
Paving	0.00	0.00	0.00	0.00	5.07

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Other Non-Asphalt Surfaces	3.21	0%
Parking Lot	1.86	100%
Library	0.00	0%
Library	0.00	0%
Library	0.00	0%
City Park	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	690	0.05	0.01
2025	0.00	690	0.05	0.01
2026	0.00	690	0.05	0.01

2027	0.00	690	0.05	0.01

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Library	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Library	1,600	1,709	1,200	568,814	10,936	11,681	8,200	3,887,845
Library	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	4.68	11.8	13.1	2,519	32.0	80.4	89.8	17,214

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Library	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Library	1,600	1,709	1,200	568,814	10,936	11,681	8,200	3,887,845
Library	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	4.68	11.8	13.1	2,519	32.0	80.4	89.8	17,214

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	168,945	56,315	13,260

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Other Non-Asphalt Surfaces	0.00	690	0.0489	0.0069	0.00
Parking Lot	70,956	690	0.0489	0.0069	0.00
Library	619,919	690	0.0489	0.0069	2,261,536

Library	387,449	690	0.0489	0.0069	1,413,460
Library	19,372	690	0.0489	0.0069	70,673
City Park	0.00	690	0.0489	0.0069	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Other Non-Asphalt Surfaces	0.00	690	0.0489	0.0069	0.00
Parking Lot	70,956	690	0.0489	0.0069	0.00
Library	619,919	690	0.0489	0.0069	2,261,536
Library	387,449	690	0.0489	0.0069	1,413,460
Library	19,372	690	0.0489	0.0069	70,673
City Park	0.00	690	0.0489	0.0069	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Other Non-Asphalt Surfaces	0.00	0.00
Parking Lot	0.00	0.00
Library	2,002,490	0.00
Library	1,251,556	0.00
Library	62,578	0.00
City Park	0.00	187

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)

Other Non-Asphalt Surfaces	0.00	0.00
Parking Lot	0.00	0.00
Library	2,002,490	0.00
Library	1,251,556	0.00
Library	62,578	0.00
City Park	0.00	187

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Other Non-Asphalt Surfaces	0.00	—
Parking Lot	0.00	—
Library	58.9	—
Library	36.8	—
Library	1.84	—
City Park	0.52	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Other Non-Asphalt Surfaces	0.00	—
Parking Lot	0.00	—
Library	58.9	—
Library	36.8	—
Library	1.84	—
City Park	0.52	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Library	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Library	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Library	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Library	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Library	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Library	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Library	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Library	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Library	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Library	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Library	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Library	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Library	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Library	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Library	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Library	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Library	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Library	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Library	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Library	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Library	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Library	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Library	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Library	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Forklifts	Diesel	Average	1.00	4.00	82.0	0.20

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Forklifts	Diesel	Average	1.00	4.00	82.0	0.20

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	3.00	2.00	200	85.0	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	7.38	annual days of extreme heat
Extreme Precipitation	6.85	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract

Exposure Indicators	—
AQ-Ozone	51.9
AQ-PM	67.1
AQ-DPM	59.2
Drinking Water	92.5
Lead Risk Housing	62.6
Pesticides	0.00
Toxic Releases	75.7
Traffic	70.7
Effect Indicators	—
CleanUp Sites	4.12
Groundwater	26.2
Haz Waste Facilities/Generators	89.7
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	28.0
Cardio-vascular	49.2
Low Birth Weights	81.0
Socioeconomic Factor Indicators	—
Education	0.42
Housing	73.0
Linguistic	11.3
Poverty	32.3
Unemployment	15.8

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	46.99088926
Employed	90.28615424
Median HI	—
Education	—
Bachelor's or higher	94.07160272
High school enrollment	100
Preschool enrollment	79.00680098
Transportation	—
Auto Access	23.27730014
Active commuting	90.15783395
Social	—
2-parent households	2.681894007
Voting	38.18811754
Neighborhood	—
Alcohol availability	9.277556782
Park access	21.32683177
Retail density	93.54548954
Supermarket access	87.87373284
Tree canopy	10.83023226
Housing	—
Homeownership	2.181444886
Housing habitability	44.16784294
Low-inc homeowner severe housing cost burden	99.12742205
Low-inc renter severe housing cost burden	50.3143847
Uncrowded housing	77.4541255

Health Outcomes	—
Insured adults	61.8760426
Arthritis	98.1
Asthma ER Admissions	78.2
High Blood Pressure	98.0
Cancer (excluding skin)	85.3
Asthma	72.9
Coronary Heart Disease	98.1
Chronic Obstructive Pulmonary Disease	97.7
Diagnosed Diabetes	98.0
Life Expectancy at Birth	75.6
Cognitively Disabled	68.5
Physically Disabled	93.4
Heart Attack ER Admissions	63.3
Mental Health Not Good	76.1
Chronic Kidney Disease	98.6
Obesity	76.5
Pedestrian Injuries	91.5
Physical Health Not Good	95.9
Stroke	97.8
Health Risk Behaviors	—
Binge Drinking	7.0
Current Smoker	77.7
No Leisure Time for Physical Activity	96.2
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0

Children	95.8
Elderly	89.5
English Speaking	60.7
Foreign-born	69.7
Outdoor Workers	98.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	1.2
Traffic Density	63.7
Traffic Access	87.4
Other Indices	—
Hardship	5.7
Other Decision Support	—
2016 Voting	38.7

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	47.0
Healthy Places Index Score for Project Location (b)	60.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Anticipated construction schedule approx. 4 years
Construction: Off-Road Equipment	Default equipment with over 75 hp Tier 4 interim
Construction: Trips and VMT	Increased default trips
Construction: Architectural Coatings	SCAQMD Rule 1113
Operations: Vehicle Data	Assumed all visitors visit for 1 or all the buildings
Construction: Dust From Material Movement	Anticipated cut and fill for project
Operations: Off-Road Equipment	Potential onsite equipment
Operations: Emergency Generators and Fire Pumps	Emergency generators

APPENDIX B

Health Risk Assessment

LA BREA TAR PITS MASTER PLAN HEALTH RISK ASSESSMENT

AUGUST 2023

PREPARED FOR

Los Angeles County Museum of Natural History Foundation

LEAD AGENCY

County of Los Angeles

PREPARED BY

SWCA Environmental Consultants

LA BREA TAR PITS MASTER PLAN
HEALTH RISK ASSESSMENT

Prepared for:

Los Angeles County Museum of Natural History Foundation
On behalf of County of Los Angeles Museum of Natural History
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Los Angeles, California 90007
Attn: Dawn McDivitt, Chief Deputy Director

Lead Agency: County of Los Angeles

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SWCA Project No. 63953

August 2023

EXECUTIVE SUMMARY

A construction health risk assessment (HRA) for the proposed La Brea Tar Pits Master Plan (project) based on construction schedule and phasing information was conducted by SWCA Environmental Consultants on August 25, 2023. The objective of the impact assessment was to evaluate potential health risks at nearby sensitive receptors. As discussed in more detail in the report, no significant health impacts to off-site sensitive receptors are anticipated as a result of the project's construction or operation activities. The assessment predicts that the maximally exposed individual receptor (MEIR) could potentially be exposed to the following levels of impact during construction and operation of the project, which are below applicable thresholds of significance for health risks.

- Construction:
    - The chronic hazard index for diesel particulate matter (DPM) exposure at the MEIR would be 0.078, which is less than the threshold of significance of 1.0.
    - The excess cancer risk at the MEIR would be 8.95 cases per million, which is less than the South Coast Air Quality Management District (SCAQMD) threshold of significance of 10 cases per million.
- Operation:
    - The chronic hazard index for DPM exposure at the MEIR would be 0.003, which is less than the threshold of significance of 1.0.
    - The excess cancer risk at the MEIR would be 7.81 cases per million, which is less than the SCAQMD threshold of significance of 10 cases per million.
    - Since the maximum cancer risk would exceed 1 in 1 million, the cancer burden (increase in cancer cases in the population) was also estimated at 0.22 persons, which would not exceed the SCAQMD threshold of 0.5.

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Appendix A: Detailed Risk Calculations

1 INTRODUCTION

1.1 Purpose

In support of the air quality technical report, the health risk assessment (HRA) modeling analysis was prepared to estimate health risk impacts to existing sensitive receptors from exposure to toxic air contaminant (TAC) emissions from construction and operation of the proposed La Brea Tar Pits Master Plan (project). The analysis in this HRA uses air dispersion modeling to evaluate potential health risks associated with the project. Results of the modeling analysis are compared with the most recent California Environmental Quality Act (CEQA) significance thresholds established by the South Coast Air Quality Management District (SCAQMD). Per State CEQA Guidelines, Appendix G (14 California Code of Regulations [CCR] 15000 et seq.), the HRA directly addresses question (d): Would the project expose sensitive receptors to substantial pollutant concentrations?

1.2 Project Description

The project would involve construction and operation of a renovated La Brea Tar Pits. These facilities would be located within the city of Los Angeles. Project construction is anticipated be completed over a period of 4 years, beginning in 2024 and ending by 2028, when operations would begin. Table 1 lists the construction schedule phasing information. Figure 1 shows a map of the proposed project area.

Table 1. Construction Schedule

Phase Name	Phase Start Date	Phase End Date	Workdays per Week	Phase Duration (Workdays)
Demolition	1/1/2024	10/31/2024	6	262
Site preparation	1/1/2024	10/31/2024	6	262
Grading	11/1/2024	12/31/2024	6	52
Building	1/1/2025	7/31/2027	6	808
Architectural	7/1/2026	9/30/2026	6	79
Paving	6/1/2027	12/31/2027	6	184

1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (California Air Resources Board [CARB] 2005). SCAQMD identifies sensitive receptors as residences, schools, playgrounds, childcare centers, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes

(SCAQMD 2022). The closest off-site sensitive receptors to the project site include residences located approximately 87 feet north and 87 feet east of the project site boundary.

1.4 Toxic Air Contaminants

A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute (short-term) and/or chronic (long-term) non-cancer health effects. A toxic substance released into the air is considered a TAC. Examples include certain aromatic and chlorinated hydrocarbons, diesel particulate matter (DPM), certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ system and may be experienced either by acute or chronic exposure to a given TAC.

California's air toxics control program began in 1983 with the passage of the Toxic Air Contaminant Identification and Control Act, Assembly Bill (AB) 1807, better known as the Tanner Bill. The Tanner Bill established a regulatory process for the scientific and public review of individual toxic compounds. When a compound becomes listed as a TAC under the Tanner process, CARB normally establishes minimum statewide emission-control measures to be adopted by air quality management districts and air pollution control districts. By 1992, CARB has listed 18 of the 189 federal hazardous air pollutants as state TACs. In April 1993, CARB added 171 substances to the state program to make the state TAC list equivalent to the federal list of hazardous air pollutants. In 1998, CARB designated diesel engine exhaust particulate matter (DPM) as a TAC (CARB 1998). The exhaust from diesel engines is a complex mixture of gases, vapors, and particles, many of which are known human carcinogens. DPM has established cancer risk factors and relative exposure values for long-term chronic health hazard impacts. No short-term, acute relative exposure values are established and regulated, and therefore are not addressed in this construction-generated assessment.

The second major component of California's air toxics program, supplementing the Tanner process, was provided by the passage of AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987. AB 2588 currently regulates over 600 compounds, including all of the Tanner-designated TACs.

Additionally, Proposition 65, passed by California voters in 1986, required that a list of carcinogenic and reproductive toxicants found in the environment be compiled, the discharge of these toxicants into drinking water be prohibited, and warnings of public exposure by air, land, or water be posted if a significant adverse public health risk is posed. The emission of any of listed substances by a facility would require a public warning unless health risks could be demonstrated to be less than significant. For carcinogens, Proposition 65 defines the "no significant risk level" as the level of exposure that would result in an increased cancer risk of greater than 10 in 1 million over a 70-year lifetime. The "no significant risk level" is 1/1,000 of the "no observable effect level" for reproductive toxicants.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On- Road Heavy Duty Diesel Vehicle (In-Use) Regulation, On-Road Heavy Duty (New) Vehicle Program, In-Use Off-Road Diesel Vehicle Regulation, and New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. Several Airborne Toxic Control Measures reduce diesel

emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

1.5 Cancer Risk

Cancer risk is defined as the increase in lifetime probability (chance) of an individual developing cancer due to exposure to a carcinogenic compound, typically expressed as the increased probability in 1 million. The cancer risk from inhalation of a TAC is estimated by calculating the inhalation (and if applicable, ingestion and dermal) dose in units of milligrams (mg) per kilogram (kg) body weight per day based on an ambient concentration in units of micrograms per cubic meter ($\mu g/m^3$), breathing rate, and exposure period, and multiplying the dose by the inhalation cancer potency factor, expressed as $(mg/kg\ body\ weight\ per\ day)^{-1}$. Cancer risks are typically calculated for all carcinogenic TACs and summed to calculate the overall increase in cancer risk to an individual. The calculation procedure assumes that cancer risk is proportional to concentrations at any level of exposure and that risks due to different carcinogens are additive. This approach is generally considered a conservative assumption at low doses and is consistent with the current Office of Environmental Health Hazard Assessment (OEHHA) regulatory approach. Exposure to carcinogenic TACs does not imply that the exposed individual would contract cancer; rather, the cancer risk is a probability of developing cancer if other factors (e.g., heredity, exposure to environmental or workplace risks that compromise the immune system, overall health) would result in an increased susceptibility to developing cancer.

1.6 Acute and Chronic Non-Cancer Health Impacts

The non-cancer health impact of an inhaled TAC is measured by the hazard quotient, which is the ratio of the ambient concentration of a TAC in unit $\mu g/m^3$ divided by the reference exposure level $\mu g/m^3$. The reference exposure level (REL) is the concentration at or below which no adverse health effects are anticipated. The REL is typically based on health effects on a particular target organ system, such as the respiratory system, liver, or central nervous system. Hazard quotients of individual TACs are then summed for each target organ system to obtain a hazard index (HI).

RELs are designed to protect the most sensitive individuals in the population, including infants and children, by selecting appropriate toxicological data and including margins of safety. Accordingly, the evaluation methods are assumed to protect children and other sensitive subpopulations (groups of more highly susceptible individuals) from adverse health effects in the event of exposure (OEHHA 2008).

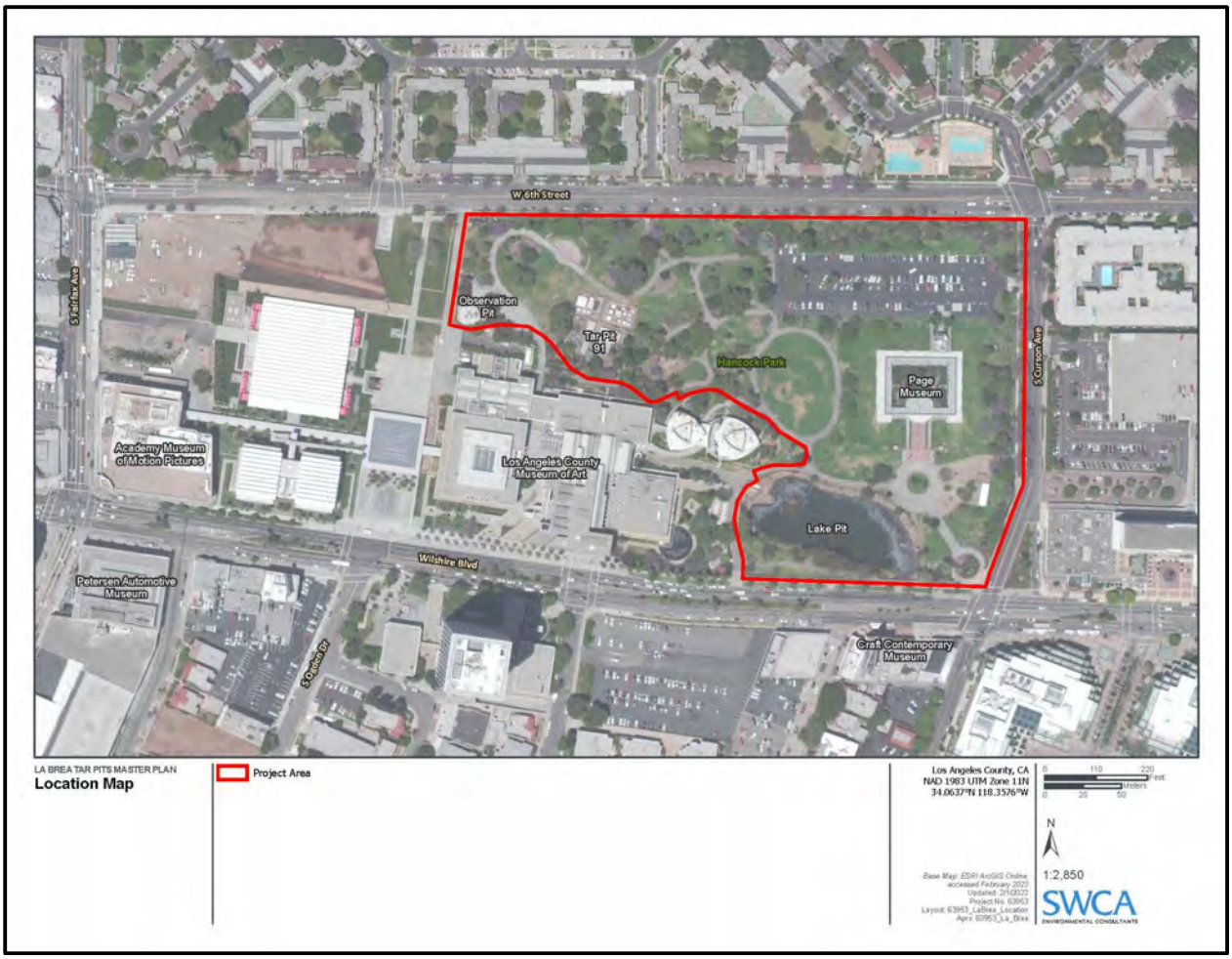

Figure 1. Project overview map.

2 SIGNIFICANCE CRITERIA

OEHHA's most recent guidance is the 2015 Risk Assessment Guidelines Manual (OEHHA 2015), which was adopted in 2015 to replace the 2003 HRA Guidance Manual. The Children's Environmental Health Protection Act of 1999 (Senate Bill 25), which requires explicit consideration of infants and children in assessing risks from air toxics, requires revisions of the methods for both non-cancer and cancer risk assessment and of the exposure assumptions in the 2003 HRA Guidance Manual. In response to Senate Bill 25, OEHHA released three technical support documents—addressing RELs (OEHHA 2008), cancer potency (OEHHA 2009), and exposure assessment and stochastic analysis (OEHHA 2012)—and adopted the 2015 Risk Assessment Guidelines Manual (OEHHA 2015). The technical support document for RELs and continuing work to reevaluate TACs to ensure adequate protection for infants and children has led to revisions of RELs for approximately 10 chemicals and chemical families. The basic methodology for evaluating acute and chronic health effects using the RELs otherwise remained the same as in the previous guidance manual.

The cancer risk methodology described in the exposure assessment and stochastic analysis technical support document and the 2015 Risk Assessment Guidelines Manual accounts for the higher sensitivity of infants and children by applying age-specific daily breathing rates and age-sensitivity factors (ASFs). According to the technical support document, "accounting for effects of early-in life exposure requires accounting for both the increased potency of early in life exposure to carcinogens and the greater exposure on a per kg body weight that occurs early in life due to behavioral and physiological differences between infants and children, and adults" (OEHHA 2012:1-6). In the absence of chemical-specific data, OEHHA recommends a default ASF of 10 for the third trimester to age 2 years, and an ASF of 3 for ages 2 through 15 years, to account for potential increased sensitivity to carcinogens during childhood (OEHHA 2015). (The ASF for adults is 1.) In addition to the ASFs, children have higher daily breathing rates per unit of body weight than adults. The OEHHA guidance manual considers the age-specific breathing rates in the cancer risk calculations.

In addition, OEHHA and CARB evaluated information from activity patterns databases to estimate the fraction of time at home (FAH) during the day. From the third trimester to age <2 years, 85% of time is spent at home. From age 2 through <16 years, 72% of time is spent at home. From age 16 years and older, 73% of time is spent at home. However, for facilities with any school within the 1 in 1 million or greater isopleth, the OEHHA recommends using an FAH of 100% for children under 16 years old (OEHHA 2015). Cancer risk parameters, such as ASFs, daily breathing rates, exposure period, FAH, and cancer potency factors were based on the values and data recommended by OEHHA as implemented in the risk calculations.

Table 2 presents the significance criteria used in this report to assess the significance of public health risks. These criteria are based on the OEHHA (OEHHA 2015), SCAQMD's Modeling Guidance for American Meteorological Society/ U.S. Environmental Protection Agency Regulatory Model (AERMOD) (SCAQMD 2006), and California Ambient Air Quality Standards (CAAQS).

Table 2. Thresholds of Significance for Public Health Risks

Risk Metric	Project-level Thresholds	Reference
Cancer Risk	10 cancers per million	OEHHA, SCAQMD
DPM Chronic Hazard Index (HI)	HI = 1 MEIR exposure/5 µg/m^3	OEHHA

In addition to cancer and non-cancer risk thresholds, if the cancer risk at the maximally exposed individual risk exceeds 1 in 1 million, the SCAQMD also requires the evaluation of cancer burden (increase in cancer cases in the population), to be compared to the threshold of 0.5 (SCAQMD 2019). No short-term, acute relative exposure values are established and regulated for DPM, and therefore these are not addressed in this assessment.

Non-cancer adverse health impacts, both acute (short term) and chronic (long term), are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental exposure concentration from the proposed project to a published reference exposure level (REL) that could cause adverse health effects as established by OEHHA. The ratio (referred to as the Hazard Quotient) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. If the overall HI for the highest-impacted organ system is greater than 1, then the impact is considered to be significant.

The HI is an expression used for the potential for non-cancer health effects. The relationship for the non-cancer health effects is given by the annual concentration (in $\mu g/m^3$) and the REL (in $\mu g/m^3$). The acute HI was determined using the "simple" concurrent maximum approach, which tends to be conservative (i.e., overpredicts).

The relationship for the non-cancer health effects is given by the following equation:

$$HI = C/REL$$

Where:

HI = Hazard index; an expression of the potential for non-cancer health effects.

C = Annual average concentration ($\mu g/m^3$) during the exposure period.

REL = Concentration at which no adverse health effects are anticipated.

The concentration level at or below which no adverse non-cancer health effects are anticipated for a specified exposure duration is termed the REL. RELs are based on the most sensitive, relevant, adverse health effect reported in the medical and toxicological literature. RELs are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact. The chronic REL for DPM was established by the California OEHHA as 5 $\mu g/m^3$.

3 MODELING METHODOLOGY

3.1 Emission Calculations

3.1.1 Construction

Emissions from the construction phase of the project were estimated using the California Emissions Estimator Model (CalEEMod) Version 2022.1. Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by Natural History Museums of Los Angeles County (Applicant) and CalEEMod default values. All assumptions pertaining to construction emissions, including phasing, equipment, and vehicle trips, are based on the Air Quality and

Greenhouse Gas Emissions Technical Report prepared for the project (SWCA Environmental Consultants 2023).

For purposes of estimating project emissions, and based on information provided by the project Applicant, construction is assumed to take place over 4 years from January 2024 through December 2027 (see Table 1). Construction-worker estimates and vendor truck trips by construction phase and construction equipment mix by construction phase were based on Applicant-provided information and CalEEMod defaults. CalEEMod default trip length values were used for the distances for worker and vendor trips.

This HRA focuses on DPM emitted from exhaust from on-site construction equipment, on-site truck travel, and worker, vendor, and haul diesel vehicles. Off-site on-road mobile source emissions are scaled based on a ratio of distance to determine the proportion of emissions that would occur within approximately 1,760 feet of the project site.

The daily emission rates from project construction were determined by dividing the maximum daily emissions (lbs/day) for each construction year by the 8 hours per day of construction. Table 3 presents the estimated unmitigated and mitigated construction exhaust particulate matter less than 10 microns in diameter (PM_{10}) emissions, a surrogate for DPM, generated during construction of the project. As shown in Section 4, the results of the HRA using the default construction emission factors in CalEEMod result in a potentially significant impact. Therefore, the mitigation measure MM-AQ-1 is included to reduce DPM emissions from construction equipment (see Section 4.4).

Table 3. Unmitigated and Mitigated Project On-Site and On-Road Construction Emissions

Year	Unmitigated Exhaust PM_{10} (lbs/hour)	Mitigated Exhaust PM_{10} (lbs/hour)
2024 (On-site)	0.306	0.034
2024 (On-road total)	0.001	0.0009
2024 (On-road per 1,760 feet)	3.27E-05	2.90E-05
2025 (On-site)	0.059	0.016
2025 (On-road total)	0.002	0.002
2025 (On-road per 1,760 feet)	5.68E-05	5.68E-05
2026 (On-site)	0.055	0.019
2026 (On-road total)	0.002	0.002
2026 (On-road per 1,760 feet)	5.68E-05	5.68E-05
2027 (On-site)	0.078	0.024
2027 (On-road total)	0.001	0.001
2027 (On-road per 1,760 feet)	4.08E-04	4.08E-05

Source: See Appendix A for risk calculations.

3.1.2 Operations

Operational year 2028 was assumed consistent with completion of project construction. Emissions from project operations include visitor, worker, and maintenance vehicle travel. For risk assessment purposes, PM_{10} in diesel exhaust is considered DPM, originating mainly from vehicle emissions off-site, and off-road/stationary equipment on-site. Visitor, worker, and maintenance traffic was modeled for one-way trip distances to 1,760 feet from the project site boundary to estimate emissions at proximate receptors.

Vehicle emission per day were obtained from CalEEMod and used to determine hourly emission rates. Per-day on-site emissions from potential off-site and stationary equipment were also obtained from CalEEMod to determine hourly emissions rates. Table 4 presents the estimated hourly operational emissions.

Table 4. Project On-Site and On-Road Operational Emissions

Year	Exhaust PM_{10} (lbs/hour)
2028 (On-site)	0.0013
2028 (On-road total)	0.05
2028 (On-road per 1,760 feet)	3.09E-03

Source: See Appendix A for risk calculations.

3.2 Air Dispersion Modeling

Air dispersion models calculate the atmospheric transport and fate of pollutants from the emission source. The models calculate the concentration of selected pollutants at specific downwind ground-level points, such as residential receptors. The transformation (fate) of an airborne pollutant, its movement with the prevailing winds (transport), its crosswind and vertical movement due to atmospheric turbulence (dispersion), and its removal due to dry and wet deposition are influenced by the pollutant's physical and chemical properties and by meteorological and environmental conditions. Factors such as distance from the source to the receptor, meteorological conditions, intervening land use and terrain, pollutant release characteristics, and background pollutant concentrations affect the predicted air concentration of an air pollutant. Air dispersion models have the capability to take all of these factors into consideration when calculating downwind ground-level pollutant concentrations.

A dispersion modeling analysis of DPM emitted from project construction diesel vehicles and off-road equipment was conducted on the areas surrounding the project site for the HRA. Furthermore, the TAC emissions from off-site vehicle travel and on-site off-road/stationary equipment were conducted on the project site for the operational HRA.

The AERMOD dispersion model (Version 21112) was used to estimate pollutant concentrations at specific distances from project emission sources using 5 years (2012–2016) of hourly meteorological data from the USC/Downtown L.A. Meteorological Station (KCQT) (Station ID 93134), obtained from SCAQMD.

Terrain elevations were obtained from commercially available digital terrain elevations developed by the U.S. Geological Survey (USGS) by using its National Elevation Dataset (USGS 2018). The National Elevation Dataset provides terrain elevations with 1-meter vertical resolution and 30-meter (1 arc-second) horizontal resolution based on a Universal Transverse Mercator (UTM) coordinate system. The USGS specifies coordinates in North American Datum 83, UTM Zone 10. Lakes Environmental software (Version 10.2.1) was used to process the National Elevation Dataset data and assign elevations to the receptor locations and sources. According to SCAQMD guidelines, the urban dispersion option was selected and Los Angeles County population for year 2021 (9,829,544 persons) was input into AERMOD.

This HRA evaluates the risk to existing residential receptors located in proximity to the project site. Receptors were placed assuming a nested grid of 2 × 2 meters. Receptors were only placed within the identified residential buildings. Flagpole receptors were included at a height of 1.8 meters and 4.8 meters, representing the first and second floors.

Off-site vehicle travel was modeled as a line of adjacent volume sources, and on-site truck travel and off-road/stationary equipment were modeled as four area sources making up the project site. The emission rates were proportioned over the area sources for on-site construction emissions and divided between the volume sources for off-site hauling emissions. To determine contaminant impacts during construction hours, the model's "hour-per-day" (HRDAY) scalar option was invoked to predict ground-level concentrations for emissions generated between the hours of 8:00 a.m. and 4:00 p.m., assuming 6 days per week. To determine contaminant impacts during operation hours, the model's "hour-per-day" (HRDAY) scalar option was invoked to predict ground-level concentrations for emissions generated between the hours of 8:00 a.m. and 4:00 p.m., conservatively assuming 6 days per week. Operation includes three emergency generators; however, testing would occur one engine at a time. The modeling includes one emergency generator running 2 hours per day for testing purposes.

3.3 Health Risk Assessment Methodology

Construction Health Risk Assessment

In March 2015, the OEHHA approved the 2015 Risk Assessment Guidelines Manual (OEHHA 2015). SCAQMD requires that all HRAs prepared for CEQA documents follow SCAQMD policies in conjunction with the 2015 Risk Assessment Guidelines Manual. Using concentrations generated by AERMOD, resulting cancer and non-cancer risk at the existing receptors from exposure to DPM emissions were assessed using the OEHHA-derived calculation method. For the purposes of this assessment, given the less-than-lifetime exposure period, and the higher breathing rates and sensitivity of children to construction-generated TACs, the cancer risk calculation assumes that the exposure would affect children early in their lives. For the residential construction health risk, the HRA assumes exposure would start in the third trimester of pregnancy and occur 8 hours per day, 6 days per week, for 4 years.

Operation Health Risk Assessment

For the operational health risk, the HRA assumes exposure would start in the third trimester through 30 years for all receptor locations. The SCAQMD has also established noncarcinogenic risk parameters for use in HRAs, since some TACs increase non-cancer health risk due to long-term (chronic) exposures and some TACs increase non-cancer health risk due to short-term (acute) exposures; however, no short-term, acute relative exposure values are established and regulated for DPM and therefore these are not addressed in this assessment. Noncarcinogenic risks are quantified by calculating a hazard index, expressed as the ratio between the ambient pollutant concentration and its toxicity or REL, which is a concentration at or below which health effects are not likely to occur. The chronic hazard index is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system.

Carcinogenic Chemical Risk

Carcinogenic compounds are not considered to have threshold levels (i.e., dose levels below which there are no risks). Any exposure, therefore, will have some associated risk. The SCAQMD has established a maximum incremental cancer risk of 10 in 1 million (1.0E-05) for CEQA projects, and OEHHA also defines a typical risk management level as 10 in 1 million (OEHHA 2015).

Health risks associated with exposure to carcinogenic compounds can be defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. The cancer risk probability is determined by multiplying the chemical's annual concentration by its cancer potency factor (CPF), a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It is an upper-limit estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of 1 $\mu g/m^3$ over a lifetime of 70 years.

Recent guidance from OEHHA recommends a refinement to the standard point estimate approach with the use of age-specific breathing rates and age sensitivity factors (ASFs) to assess risk for susceptible subpopulations such as children. For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify dose for each age group. Once determined, contaminant dose is multiplied by the CPF in units of inverse dose expressed in milligrams per kilogram per day (mg/kg/day) to derive the cancer risk estimate. Therefore, to accommodate the unique exposures associated with the residential-based receptors, the following dose algorithm was used:

$$\mathbf{DOSE_{air} = (C_{air} \times \{BR/BW\} \times A \times EF \times ED \times 10^{-6}) / AT}$$

Where:

$DOSE_{air}$	= Dose through inhalation (mg/kg-day)
C_{air}	= Concentration in air ($\mu g/m^3$) (calculated by AERMOD)
{BR/BW}	= Daily breathing rate normalized to body weight (liters/kg body weight-day)
A	= Inhalation absorption factor (unitless)
EF	= Exposure frequency (unitless), days/365 days
10^{-6}	= Micrograms to milligrams conversion, liters to cubic meters conversion
ED	= Exposure duration (in years) for a specified age group
AT	= Averaging time for lifetime cancer risk (years)

The inhalation absorption factor (A) is a unitless factor that is only used if the cancer potency factor included a correction for absorption across the lung. For this assessment, the default value of 1 was used. For residential receptors, the exposure frequency (EF) of 0.96 is used to represent 350 days per year to allow for a 2-week period away from home each year (OEHHA 2015). This timeline is considered appropriate for potential residential exposures established by OEHHA (2015). For residential receptors, the 95th percentile daily breathing rates (BR/BW), exposure durations (ED) over the 4-year construction period, age sensitivity factors (ASFs), and fraction of time at home (FAH) for the various age groups are provided in Appendix A.

For construction analysis, the residential exposure duration spans the length of construction (e.g., 4 years). To calculate the overall cancer risk, the risk for each appropriate age group is calculated per the following equation:

$$\mathbf{RISK_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times FAH}$$

Where:

$RISK_{inh\text{-}res}$	= Residential inhalation cancer risk
$DOSE_{air}$	= Daily inhalation dose (milligrams/kilogram [mg/kg]-day)
CPF	= Inhalation cancer potency factor ($mg/kg\text{-}day^{-1}$)
ASF	= Age sensitivity factor for a specified age group (unitless)
FAH	= Fraction of time spent at home (unitless)

The CPFs used in the assessment were obtained from OEHHA guidance. The excess lifetime cancer risks during the construction period to the maximally exposed resident were calculated based on the factors provided in Appendix A. The cancer risks for each age group are summed to estimate the total cancer risk for each toxic chemical species. For purposes of this assessment, the calculated residential cancer risks associated with construction activities are based on the following age groups: third trimester, 0 to 2 years old, 2 to 9 years old, and 16 to 30 years old. The final step converts the cancer risk in scientific notation to a whole number that expresses the cancer risk in “chances per million” by multiplying the cancer risk by a factor of 1x106 (i.e., 1 million). For construction, the calculated results are provided in Appendix A.

Non-Carcinogenic Hazards

An evaluation of the potential non-cancer effects of chronic chemical exposures was also conducted. Adverse health effects are evaluated by comparing the annual receptor level (ground) concentration of each chemical compound with the appropriate reference exposure limit (REL). Available RELs promulgated by OEHHA were considered in the assessment.

To quantify non-carcinogenic impacts, the hazard index approach was used. The HI assumes that chronic and acute subthreshold exposures adversely affect a specific organ or organ system (toxicological endpoint). For each discrete chemical exposure, target organs presented in regulatory guidance were used. To calculate the HI, each chemical concentration or dose is divided by the appropriate toxicity value.

For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds 1, a health hazard is presumed to exist. For construction, the chronic hazard analysis for DPM is provided in Appendix A. The calculations contain the relevant exposure concentrations and corresponding reference dose values used in the evaluation of noncarcinogenic exposures.

4 HEALTH RISK ANALYSIS RESULTS

4.1 Construction

The cancer risk calculations were performed by multiplying the AERMOD-predicted DPM concentrations in $\mu g/m^3$ due to DPM emissions from off-site vehicles and on-site construction equipment by the appropriate risk values. The potential exposure pathway for DPM includes inhalation only. The potential exposure through other pathways (e.g., ingestion) requires substance and site-specific data, and the specific parameters for DPM are not known for these pathways (CARB 1998).

The excess cancer risks to off-site receptors due to project construction are calculated assuming exposure during the entire calendar year to the emission rates presented in Appendix A for the respective calendar year. For construction analysis, the exposure duration spans the length of construction. As the length of construction is equal to 4 years, only the third trimester, 0–2, and 2–9 age bins apply to the construction analysis for the off-site residential receptors. A more detailed breakdown of the risk calculations is included in Appendix A.

Table 5 shows the maximum cancer and chronic health risks at the maximally exposed residential receptor from project construction. AERMOD concentrations per construction year are in Appendix A.

Table 5. Excess Cancer Risk – Unmitigated

Impact Parameter	Unit	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	per million	78.07	10	**Potentially Significant**
Chronic Hazard Index – Residential	HI value	0.08	1.0	Less than Significant

Source: SCAQMD (2022a)
Note: See Appendix A for detailed results.

As shown in Table 5, the HRA results from the unmitigated scenario show cancer risks exceeding the 10 in 1 million threshold and thus a potentially significant impact at the maximally exposed individual

residential receptors. These potentially significant health risk impacts triggered the requirement of MM-AQ-1 (see Section 4.4) in order to reduce project construction-generated DPM emissions to the extent feasible. The HRA results after incorporation of MM-AQ-1 are presented in Table 6.

Table 6. Excess Cancer Risk – Mitigated

Impact Parameter	Unit	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	per million	8.95	10	**Potentially Significant**
Chronic Hazard Index – Residential	HI value	0.007	1.0	Less than Significant

Source: SCAQMD (2019)
Note: See Appendix A for detailed results.

As shown in Table 6, with the implementation of mitigation MM-AQ-1 requiring Tier 4 Interim equipment, the estimated cancer risk during project construction would be reduced below the SCAQMD threshold of 10 in 1 million (approximately 8.95 in a million). This level of risk would occur if an individual's exposure began in the third trimester of pregnancy and lasted for the duration of the project construction.

Non-cancer risk resulting from chronic exposure to construction DPM are also presented in Table 5 and Table 6. Risks are presented in terms of hazard index (HI), which is derived from the ratio of the concentration of DPM at the receptor over the REL. The project's construction impacts would have an HI of less than 1 at the MEIR, which indicates that the project would not expose sensitive receptors to chronically harmful levels of DPM (see Table 6). Therefore, the impacts to public health risk from construction of the project are less than significant. A more detailed summary of modeled results is included in Appendix A.

4.2 Operations

The operational cancer risk calculations were performed by multiplying the AERMOD-predicted TAC concentrations in µg/m³ due to TAC emissions from off-site vehicle travel and on-site off-road/stationary equipment by the appropriate risk values. The mandatory potential exposure through pathways (e.g., ingestion) are selected for the operation-generated TAC emissions. Table 7 summarizes the HRA results based on the HRA methodology described above and contained in Appendix A.

The excess cancer risks to off-site receptors due to project construction are calculated assuming exposure during the entire calendar year to the emission rates presented in Appendix A for the respective calendar year. Total excess cancer risks over 30 years are determined by adding the risks from each calendar year. A more detailed breakdown of the risk calculations is included in Appendix A. Operation of the project would result in a maximum excess cancer risk of approximately 7.81 in 1 million.

Table 7. Operations Excess Cancer Risk

Impact Parameter	Unit	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	per million	7.81	10	**Potentially Significant**
Chronic Hazard Index – Residential	HI value	0.003	1.0	Less than Significant

Source: SCAQMD (2022a)
Note: See Appendix A for detailed results.

As shown in Table 7, the project's potential cancer health risk of 7.81 in 1 million would not exceed the SCAQMD threshold of 10 in 1 million. Because the project-level threshold of significance is less than 10 cases per million, project operations would not result in significant impacts to excess cancer risk.

Non-cancer risk resulting from chronic exposure to operational DPM are also presented in Table 7. Risks are presented in terms of hazard index (HI), which is derived from the ratio of the concentration of DPM at the receptor over the REL. The project's operational impacts would have an HI of less than 1 at the MEIR, which indicates that the project would not expose sensitive receptors to chronically harmful levels of DPM. Therefore, the impacts to public health risk from operation of the project are less than significant. A more detailed summary of modeled results is included in Appendix A.

4.3 Cancer Burden

As determined, since the cancer risk from project operation at the maximally exposed individual resident exceeds 1 in 1 million, cancer burden—which has a SCAQMD significance threshold of 0.5—is evaluated. Unlike cancer risk, which is the lifetime probability (chance) of an individual developing cancer due to exposure to a carcinogenic compound, cancer burden estimates the number of theoretical cancer cases in a defined population resulting from a lifetime exposure to carcinogenic TACs. As described in the OEHHA guidance manual:

> The cancer burden can be calculated by multiplying the cancer risk at a census block centroid by the number of people who live in the census block, and adding up the estimated number of potential cancer cases across the zone of impact. The result of this calculation is a single number that is intended to estimate of the number of potential cancer cases within the population that was exposed to the emissions for a lifetime (70 years). (OEHHA 2015:8-16)

The SCAQMD has established a procedural screening approach for estimating cancer burden (SCAQMD 2019), which includes the following steps:

- Recalculate cancer risk from all TACs using a 70-year exposure duration.
- Estimate the distance at which the maximum individual cancer risk from a 70-year exposure duration falls below 1 in 1 million.
- Define a zone of impact in the shape of a circle, with the radius equal to the distance between the TAC source and the point at which the risk falls below 1 in 1 million.
- Estimate the residential population within this zone of impact based on census data or a worse-case estimate.
- Calculate the screening level cancer burden by multiplying the total residential population in the zone of impact by the maximum individual cancer risk.

The maximum estimated 70-year cancer risk for project operation was estimated at 9.11 in 1 million. The total population in the zone of impact area was estimated to be approximately 24,644 persons, based on the average densities of the Census Tracts that would be within the zone of impact (Census Tract 2151.01, 2151.02, 2162.01, 2163.02, 2145.01, 2145.03, 2145.04, and 2147) (U.S. Census Bureau 2020).

Multiplying the maximum estimated 70-year cancer risk by the project population gives a cancer burden of 0.22. Accordingly, the cancer burden indicates that less than one person could contract cancer assuming a 70-year exposure under the modeled scenario of TAC emissions and provided that other factors related to an individual's susceptibility to contracting cancer would occur. An estimated cancer burden of 0.22 would be less than the SCAQMD cancer burden threshold of 0.5. Thus, the impact with respect to potential cancer burden due to project operations would be less than significant.

4.4 Mitigation Measures

MM-AQ-1: To reduce the potential for health risks as a result of construction of the project, the Applicant shall:

- Prior to the start of construction activities, it shall be ensured that all 75-horsepower or greater diesel-powered equipment are powered with CARB-certified Tier 4 Interim engines, except where the County determines that Tier 4 Interim equipment is not available.
- All other diesel-powered construction equipment will be classified as Tier 3 or higher, at a minimum, except where the County determines Tier 3 equipment is not available.

There are several other SCAQMD rules and regulations that serve as mitigation measures for the project construction. These rules are:

- SCAQMD Rule 403, which requires projects to incorporate fugitive dust control measures;
- SCAQMD Rule 1113, which limits the volatile organic compound content of architectural coating; and
- SCAQMD Regulation XIII, New Source Review, which requires new on-site facility nitrogen oxide emissions to be minimized through the use of emission control measures (e.g., use of best available control technology for new combustion sources such as boilers and water heaters).

5 CONCLUSIONS

The results determined in this analysis reflect reasonable estimates of source emissions and exhaust characteristics, available meteorological data near the project site, and the use of currently approved air quality models. Given the limits of available tools for such an analysis, the actual impacts may vary from the estimates in this assessment. However, the combined use of the AERMOD dispersion model and the health impact calculations required by OEHHA and SCAQMD tend to overpredict impacts, such that they produce conservative (i.e., health protective) results. For this reason, the estimated cancer risks and non-cancer hazard indices reported in this analysis are likely upper-bound estimates for potential exposure to project-related emissions. In addition, the estimated cancer risks and non-cancer hazard indices represent the maximum exposed individual resident, and do not represent the risk over a broad area. The actual risks of cancer or non-cancer effects from the project are likely to be lower than presented herein.

Based on this analysis, project construction would result in potential chronic health risk and potential cancer health risk impacts at the maximally exposed residential receptor below the OEHHA threshold

without the need for mitigation. However, potential cancer health risk impacts from project construction at the proximate existing residential receptors would exceed the SCAQMD threshold. With implementation of mitigation measure MM-AQ-1, potential cancer risk at the maximally exposed residential receptor would be reduced to a less-than-significant level. Potential health risk at existing residential receptors from project operation would result in potential cancer health risk and chronic health risk that would not exceed the applicable SCAQMD thresholds. This would be a less-than-significant impact. The project would also result in less-than-significant cancer burden impacts.

6 REFERENCES

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APPENDIX A – Detailed Risk Calculations

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2024 - Unmitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.42218	µg/m3

Age Bin	Infant/Child				Adult	
	3rd trimester	0<2 years			16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})	1.461E-04	4.413E-04			1.057E-04	
Risk = DOSEair * CPF * ASF * ED/AT * FAH	4.880E-06	5.894E-05			1.697E-05	
Total Cancer Risk (per million)	4.8802	58.9404			16.9691	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**8.44E-02**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	4.22E-01	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (3rd trimester)	361	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (0 < 2 yrs)	1090		
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.4222	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (3rd trimester)	0.25	years	Exposure duration (years)
	ED (0 < 2 years)	1		
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (3rd trimester-2 yrs)	10	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (3rd trimester-2 yrs)	0.85	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2025 - Unmitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.07602	µg/m3

Age Bin	Infant/Child				Adult	
		0<2 years			16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})		7.946E-05			1.903E-05	
Risk = DOSEair * CPF * ASF * ED/AT * FAH		1.061E-05			3.056E-06	
Total Cancer Risk (per million)		10.6131			3.0555	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**1.52E-02**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	7.60E-02	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (0 < 2 yrs)	1090	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.0760	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (0 < 2 years)	1	years	Exposure duration (years)
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (3rd trimester-2 yrs)	10	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (3rd trimester-2 yrs)	0.85	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2026 - Unmitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.07098	µg/m3

Age Bin	Infant/Child				Adult	
			2<9 years		16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})			4.295E-05		1.776E-05	
Risk = DOSEair * CPF * ASF * ED/AT * FAH			1.458E-06		2.853E-06	
Total Cancer Risk (per million)			1.4578		2.8530	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**1.42E-02**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	7.10E-02	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (2 < 9 yrs)	631	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.0710	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (2 < 9 years)	1	years	Exposure duration (years)
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (2 - 16 years)	3	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (2 - 16 years)	0.72	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2027 - Unmitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.10585	µg/m3

Age Bin	Infant/Child				Adult	
			2<9 years		16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})			6.405E-05		2.649E-05	
Risk = DOSEair * CPF * ASF * ED/AT * FAH			2.174E-06		4.255E-06	
Total Cancer Risk (per million)			2.1739		4.2545	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**2.12E-02**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	1.06E-01	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (2 < 9 yrs)	631	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.1059	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (2 < 9 years)	1	years	Exposure duration (years)
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (2 - 16 years)	3	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (2 - 16 years)	0.72	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

Construction Cancer Risk by Year				
Exposure Year	Age	Infant/Child - Exposure Information		Infant/Child Cancer Risk
		DPM Conc (ug/m3)		
		Year	Annual	(per million)
0	-0.25-0*	2024	0.42218	4.880
1	0-1	2024	0.42218	58.940
2	1-2	2025	0.07602	10.613
3	2-3	2026	0.07098	1.458
4	3-4	2027	0.10585	2.174
5	4-5	0	-	-
6	5-6	0	-	-
7	6-7	0	-	-
8	7-8	0	-	-
9	8-9	0	-	-
10	9-10	0	-	-
11	10-11	0	-	-
12	11-12	0	-	-
13	12-13	0	-	-
14	13-14	0	-	-
15	14-15	0	-	-
16	15-16	0	-	-
17	16-17	0	-	-
18	17-18	0	-	-
19	18-19	0	-	-
20	19-20	0	-	-
21	20-21	0	-	-
22	21-22	0	-	-
23	22-23	0	-	-
24	23-24	0	-	-
25	24-25	0	-	-
26	25-26	0	-	-
27	26-27	0	-	-
28	27-28	0	-	-
29	28-29	0	-	-
30	29-30	0	-	-
		Total Cancer Risk - Infant/Child		**78.065**
Threshold:	**10.0000**			
Cancer Burden:	**2.5925**		**24644**	**persons**

*3rd Trimester of pregnancy

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2024 - Mitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.03648	µg/m3

Age Bin	Infant/Child				Adult	
	3rd trimester	0<2 years			16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})	1.263E-05	3.813E-05			9.130E-06	
Risk = DOSEair * CPF * ASF * ED/AT * FAH	4.217E-07	5.093E-06			1.466E-06	
Total Cancer Risk (per million)	0.4217	5.0930			1.4663	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**7.30E-03**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	3.65E-02	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (3rd trimester)	361	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (0 < 2 yrs)	1090		
	BR/BW (2 < 9 yrs)	631		
	BR/BW (2 < 16 yrs)	572		
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.0365	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (3rd trimester)	0.25	years	Exposure duration (years)
	ED (0 < 2 years)	1		
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (3rd trimester-2 yrs)	10	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (3rd trimester-2 yrs)	0.85	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2025 - Mitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.01769	µg/m3

Age Bin	Infant/Child				Adult	
		0<2 years			16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})		1.849E-05			4.427E-06	
Risk = DOSEair * CPF * ASF * ED/AT * FAH		2.470E-06			7.110E-07	
Total Cancer Risk (per million)		2.4697			0.7110	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**3.54E-03**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	1.77E-02	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (0 < 2 yrs)	1090	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.0177	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (0 < 2 years)	1	years	Exposure duration (years)
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (3rd trimester-2 yrs)	10	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (3rd trimester-2 yrs)	0.85	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2026 - Mitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.02039	µg/m3

Age Bin	Infant/Child				Adult	
			2<9 years		16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})			1.234E-05		5.103E-06	
Risk = DOSEair * CPF * ASF * ED/AT * FAH			4.188E-07		8.196E-07	
Total Cancer Risk (per million)			0.4188		0.8196	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**4.08E-03**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	2.04E-02	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (2 < 9 yrs)	631	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.0204	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (2 < 9 years)	1	years	Exposure duration (years)
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (2 - 16 years)	3	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (2 - 16 years)	0.72	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

La Brea Tar Pits Master Plan Construction Health Risk Calculations

Construction Year 2027 - Mitigated		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.02639	µg/m3

Age Bin	Infant/Child				Adult	
			2<9 years		16<30 years	
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})			1.597E-05		6.605E-06	
Risk = DOSEair * CPF * ASF * ED/AT * FAH			5.420E-07		1.061E-06	
Total Cancer Risk (per million)			0.5420		1.0607	
Cancer Risk Threshold	**10**					

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**5.28E-03**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	2.64E-02	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (2 < 9 yrs)	631	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.0264	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (2 < 9 years)	1	years	Exposure duration (years)
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (2 - 16 years)	3	Age Sensitivity Factor	
	ASF (16 - 70 years)	1		
FAH	FAH (2 - 16 years)	0.72	Fraction of time spent at home (unitless)	
	FAH (16 - 70 years)	0.73		

Construction Cancer Risk by Year				
Exposure Year	Age	Infant/Child - Exposure Information		Infant/Child Cancer Risk
		DPM Conc (ug/m3)		
		Year	Annual	(per million)
0	-0.25-0*	2024	0.03648	0.422
1	0-1	2024	0.03648	5.093
2	1-2	2025	0.01769	2.470
3	2-3	2026	0.02039	0.419
4	3-4	2027	0.02639	0.542
5	4-5	0	-	-
6	5-6	0	-	-
7	6-7	0	-	-
8	7-8	0	-	-
9	8-9	0	-	-
10	9-10	0	-	-
11	10-11	0	-	-
12	11-12	0	-	-
13	12-13	0	-	-
14	13-14	0	-	-
15	14-15	0	-	-
16	15-16	0	-	-
17	16-17	0	-	-
18	17-18	0	-	-
19	18-19	0	-	-
20	19-20	0	-	-
21	20-21	0	-	-
22	21-22	0	-	-
23	22-23	0	-	-
24	23-24	0	-	-
25	24-25	0	-	-
26	25-26	0	-	-
27	26-27	0	-	-
28	27-28	0	-	-
29	28-29	0	-	-
30	29-30	0	-	-
		Total Cancer Risk - Infant/Child		**8.945**
Threshold:	**10.0000**			
Cancer Burden:	**0.3204**		**24644**	**persons**

*3rd Trimester of pregnancy

La Brea Tar Pits Master Plan Operations Health Risk Calculations

Operation Year 2028		
PM_{10} (µg/m3)		
Annual Avg Concentration:	0.0132	µg/m3

Age Bin	Infant/Child				Adult	
	3rd trimester	0<2 years	2<9 years	2<16 years	16<30 years	16<70 years
DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})	4.569E-06	1.380E-05	7.987E-06	7.240E-06	3.304E-06	2.949E-06
Risk = DOSEair * CPF * ASF * ED/AT * FAH	1.526E-07	3.686E-06	1.898E-06	3.441E-06	5.306E-07	1.827E-06
Total Cancer Risk (per million)	0.1526	3.6857	1.8977	3.4405	0.5306	1.8269

Total Cancer Risk (per million)		
70-year exposure	9.11E-06	9.11
30-year exposure	7.81E-06	7.81
9-year exposure	5.74E-06	5.74
	Cancer Risk Threshold	**10**

70-year exposure - Cancer Burden	0.22	
30-year exposure - Cancer Burden	0.19	
9-year exposure - Cancer Burden	0.14	
	Number of Persons	**24644**
	Cancer Burden Threshold	**0.5**

Chronic Noncancer Hazard		
Hazard Quotient = Ci/RELi =	**2.64E-03**	
Threshold:	**1.00**	
Ci - Concentration (annual average)	1.32E-02	µg/m3
RELi - Reference Exposure Level for Diesel Exhaust	5	

	10+6	1.00E+06	per million	
	CPF	1.1E+00	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW	BR/BW (3rd trimester)	361	L/kg bodyweight- day	Daily Breathing rate normalized to body weight
	BR/BW (0 < 2 yrs)	1090		
	BR/BW (2 < 9 yrs)	631		
	BR/BW (2 < 16 yrs)	572		
	BR/BW (16 < 30 yrs)	261		
	BR/BW (16 < 70 yrs)	233		
	$_{10}$-6	1.00E-06	Micrograms to milligrams conversions, liters to cubic meters conversion	
	Cair	0.0132	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1	Inhalation absorption factor	
	EF	0.96	days/year	Exposure frequency (days/year)
ED	ED (3rd trimester)	0.25	years	Exposure duration (years)
	ED (0 < 2 years)	2		
	ED (2 < 9 years)	7		
	ED (2 < 16, 16 < 30 years)	14		
	ED (16 - 70 years)	54		
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (3rd trimester-2 yrs)	10	Age Sensitivity Factor	
	ASF (2 - 16 years)	3		
	ASF (16 - 70 years)	1		
FAH	FAH (3rd trimester-2 yrs)	0.85	Fraction of time spent at home (unitless)	
	FAH (2 - 16 years)	0.72		
	FAH (16 - 70 years)	0.73		

APPENDIX D

Historic Resources Technical Report

Historic Resources Technical Report, La Brea Tar Pits Master Plan, Los Angeles, California

JANUARY 2023

PREPARED FOR

Los Angeles County Museum of Natural History Foundation

LEAD AGENCY

County of Los Angeles

PREPARED BY

SWCA Environmental Consultants

HISTORIC RESOURCES TECHNICAL REPORT, LA BREA TAR PITS MASTER PLAN, LOS ANGELES, CALIFORNIA

Prepared for

Los Angeles County Museum of Natural History Foundation
On behalf of County of Los Angeles Museum of Natural History
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SWCA Project No. 63953

January 2023

EXECUTIVE SUMMARY

Purpose and Scope:

The 13-acre La Brea Tar Pits Master Plan project site is located within the eastern and northeastern portions of the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902). The La Brea Tar Pits, the George C. Page Museum (Page Museum), and associated facilities, are owned by the County of Los Angeles but are managed by the non-profit Los Angeles County Museum of Natural History Foundation (Foundation). The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the Los Angeles County Museum of Natural History, including the La Brea Tar Pits and Page Museum. The County of Los Angeles (County) is the Lead Agency under the California Environmental Quality Act (CEQA); the Museum of Natural History is a County departmental unit. The Foundation retained SWCA Environmental Consultants (SWCA) to prepare a Historic Resources Technical Report in support of the La Brea Tar Pits Master Plan (proposed project) in the City of Los Angeles, California.

The Foundation proposes a reimagined site design, expansion, and upgrades for the La Brea Tar Pits complex, including renovations to the Page Museum and changes to portions of the surrounding Hancock Park. The project site is located at 5801 W. Wilshire Boulevard in the Mid-Wilshire corridor of Los Angeles, California. The project site is adjacent to the Los Angeles County Museum of Art (LACMA).

This report provides the substantial evidence required under the California Environmental Quality Act (CEQA) 1) to determine the historic resource status of the properties within and directly adjacent to the project site, and 2) to assess the possibility for direct and/or indirect significant adverse impacts to historical resources that would result from project implementation. (Archaeological and tribal cultural resources are addressed in a separate accompanying study.) For purposes of this report, the CEQA Area of Potential Effects (APE) encompasses the project site and directly adjacent parcels one parcel over.

Dates of Investigation:

In support of this study, field surveys took place on February 25 and July 29, 2022. All properties within the CEQA APE were inspected and photographed. In addition, to accurately characterize the proposed project, SWCA met with the Foundation and the design team in order to review project drawings, architectural plans and conceptual sketches, and site design concepts.

To characterize all properties within the CEQA APE, SWCA conducted primary- and secondary-source research in a wide variety of collections. Research focused on a variety of materials relating to the history and development of the project site and its role in the history of institutional/cultural development in Los Angeles. Materials consulted included historical maps, photographs, and newspapers; aerial and ground photographs; publications and journal articles; among other materials.

Following fieldwork, subject properties were documented, evaluated, and assigned the appropriate California Historical Resources (CHR) status code. The principal elements of the proposed project were studied for potential direct and indirect impacts to historical resources pursuant to CEQA.

Research, evaluations, analysis, and report preparation took place between February and August 2022.

Summary of Findings:

As a result of this study, SWCA identified three historic resources within the project footprint: the La Brea Tar Pits Historic District (eligible at the state and local levels), the Page Museum (eligible at the federal, state, and local levels), and the Hancock Park Observation Pit (eligible at the federal, state, and local levels). Another eight resources were identified adjacent to the project footprint: Pavilion for Japanese Art, Park La Brea Garden Apartment Historic District, Prudential Square (5757 W. Wilshire Boulevard), Craft and Folk Art Museum (5814 W. Wilshire Boulevard), Hancock Park Building (5820 W. Wilshire Boulevard), CMAY Gallery (formerly Arthur Murray Dance Studio, 5828 W. Wilshire Boulevard), Office Building (5850 W. Wilshire Boulevard), and the Mutual Benefit Life Plaza (5900 Wilshire Boulevard).

Based on available project information, the potential exists for **significant and unavoidable direct adverse impacts** to **both** the La Brea Tar Pits Historic District and the Page Museum. Although the project would retain the Page Museum, it is anticipated that project implementation would render the resource no longer eligible at the federal, state, and local levels, resulting in material impairment.

Although the project would retain many contributing features of the La Brea Tar Pits Historic District, it is anticipated that project implementation would render the historic district no longer eligible at the state and local levels, resulting in material impairment.

No significant, indirect adverse impacts would be likely to result from project implementation.

Conclusion:

Due to the potential for direct, significant adverse impacts to historic resources, the Environmental Impact Report (EIR) must include a range of feasible alternatives and mitigation measures/project design features capable of reducing, avoiding, and/or eliminating significant adverse impacts.

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1. INTRODUCTION

Project Purpose and Scope

The 13-acre La Brea Tar Pits Master Plan project site is located within the eastern and northeastern portions of the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902). The La Brea Tar Pits, the George C. Page Museum (Page Museum), and associated facilities, are owned by the County of Los Angeles but are managed by the non-profit Los Angeles County Museum of Natural History Foundation (Foundation). The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the Los Angeles County Museum of Natural History, including the La Brea Tar Pits and Page Museum. The Foundation retained SWCA Environmental Consultants (SWCA) to prepare a Historic Resources Technical Report in support of the proposed La Brea Tar Pits Master Plan (proposed project) in the City of Los Angeles, California.

The County of Los Angeles (County) is the Lead Agency under the California Environmental Quality Act (CEQA); the Museum of Natural History is a County departmental unit.[1]

The Foundation proposes a redevelopment, or "reimagining," of the La Brea Tar Pits site, including the Page Museum and portions of the surrounding Hancock Park. The Foundation proposes a reimagined site design, expansion, and upgrades for the La Brea Tar Pits complex, including renovations to the Page Museum. The project site is located at 5801 W. Wilshire Boulevard in the Mid-Wilshire corridor of Los Angeles, California. Hancock Park was established on the site in the early twentieth century. The project site is adjacent to the Los Angeles County Museum of Art (LACMA).

The project site encompasses the La Brea Tar Pits, whose facilities include the 1977 Page Museum; 1952 Observation Pit; various tar pit excavation sites and features, primarily with temporary construction serving as support facilities; a concession and public restroom building; a multipurpose lawn and recreational areas; hardscaping/landscaping features throughout the park; and a surface parking lot.

This study was conducted to address potentially significant adverse direct and indirect impacts to historical resources to facilitate compliance with the California Environmental Quality Act (CEQA), as codified in Public Resources Code (PRC) Section 5024.1, Title 14 California Code of Regulations (CCR) Section 15064.5 of the CEQA Guidelines, and PRC Sections 21083.2 and 21084.1.

This study pertains only to historical resources. Archaeological and tribal cultural resources are addressed in a separate, accompanying study.

Key Personnel

The lead author and investigator for this study was Senior Team Lead for Architectural History, Debi Howell-Ardila, MHP. Dan Herrick, Historic Preservation Specialist, served as co-author and researcher of the report. Susan Zamudio-Gurrola, MHP, contributed to researching and writing the report. SWCA Senior Strategic Advisor, Leslie Heumann, provided oversight and quality assurance/quality

[1] In accordance with Chapter 2.94 of the Los Angeles County Code and various other operating agreements, the County Museum of Natural History is a department of the County and has administrative charge and control over all County matters relating to history and science, and shall also include the administration of Hancock Park (except that area of said park devoted to the Los Angeles County Museum of Art [LACMA]), and the care, safeguarding, and maintenance of all exhibits, equipment, and structural improvements directly relating to exhibits, the administration and maintenance of LACMA, and other property hereafter acquired for or devoted to history and science.

control (QA/QC). John Dietler, Ph.D., RPA, served as the Principal-in-charge of the project, and Bobbette Biddulph was the Project Manager.

Copies of the report are on file with the City of Los Angeles, Los Angeles County Museum of Natural History Foundation, SWCA's Pasadena office, and the South Central Coastal Information Center at California State University, Fullerton.

2. PROJECT DESCRIPTION

Project Location

The La Brea Tar Pits is located at 5801 W. Wilshire Boulevard within the 23-acre Hancock Park (APN 5508-016-902). The project site spans 13 acres of the eastern and northwestern portions of Hancock Park. The project site is directly adjacent to the Los Angeles County Museum of Art (LACMA), which is presently under construction. LACMA is not included within the project site.

Located in the Wilshire Community Plan Area, the project site is located approximately 5.5 miles west of downtown Los Angeles. It is bounded by West 6th Street to the north, South Curson Avenue to the east, Wilshire Boulevard to the south, and LACMA to the west, in the "Miracle Mile" neighborhood of Los Angeles (Figure 1, Figure 2, and Figure 3).

Proposed Project

The proposed project is a reimagining of the La Brea Tar Pits complex, including the Page Museum and surrounding Hancock Park. Maintaining the current uses of these spaces—as an international destination for research and as a local destination for recreation—is a core objective of the project.

In addition, retaining the Page Museum's iconic Pleistocene frieze, visible laboratory, and Ice Age gardens and landscapes are also included as part of the proposed project. As a primary objective, the project would update and expand the use of these spaces, modernize the interpretations and exhibits, make more of the collection visible to the public, increase research and presentation space, and make the site more environmentally sustainable through the capture of stormwater.

Overall, the Master Plan consists of nine principal project components, as shown in Figure 4. These are: 1) Page Museum Renovations, 2) Wilshire Gateway Entry Plaza and Lake Pit, 3) Enhanced Central Green, 4) Revamped Pit 91, 5) New Museum Building, 6) New Public Promenade, 7) New Pedestrian Path, 8) 6th Street Entry Gateway, and 9) Support Building. Figure 4 shows the proposed site plan with each of these nine project components labeled and numbered.

The EIR for the La Brea Tar Pits Master Plan provides the full description of the proposed project. The following summarizes project elements most pertinent for historical resources.

Figure 1. Project vicinity map

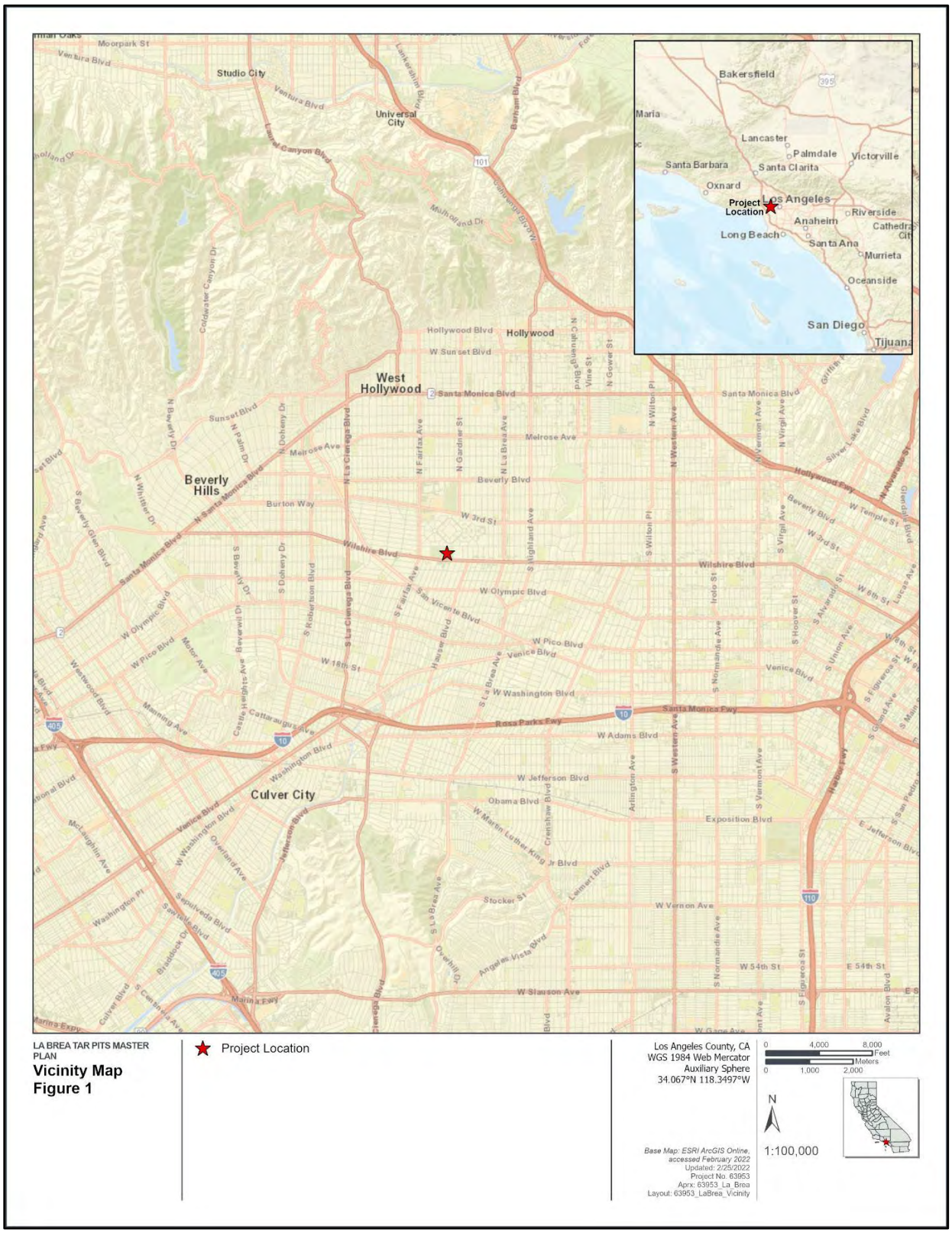


Figure 2. Project site shown on U.S. Geological Survey 7.5-minute quadrangle

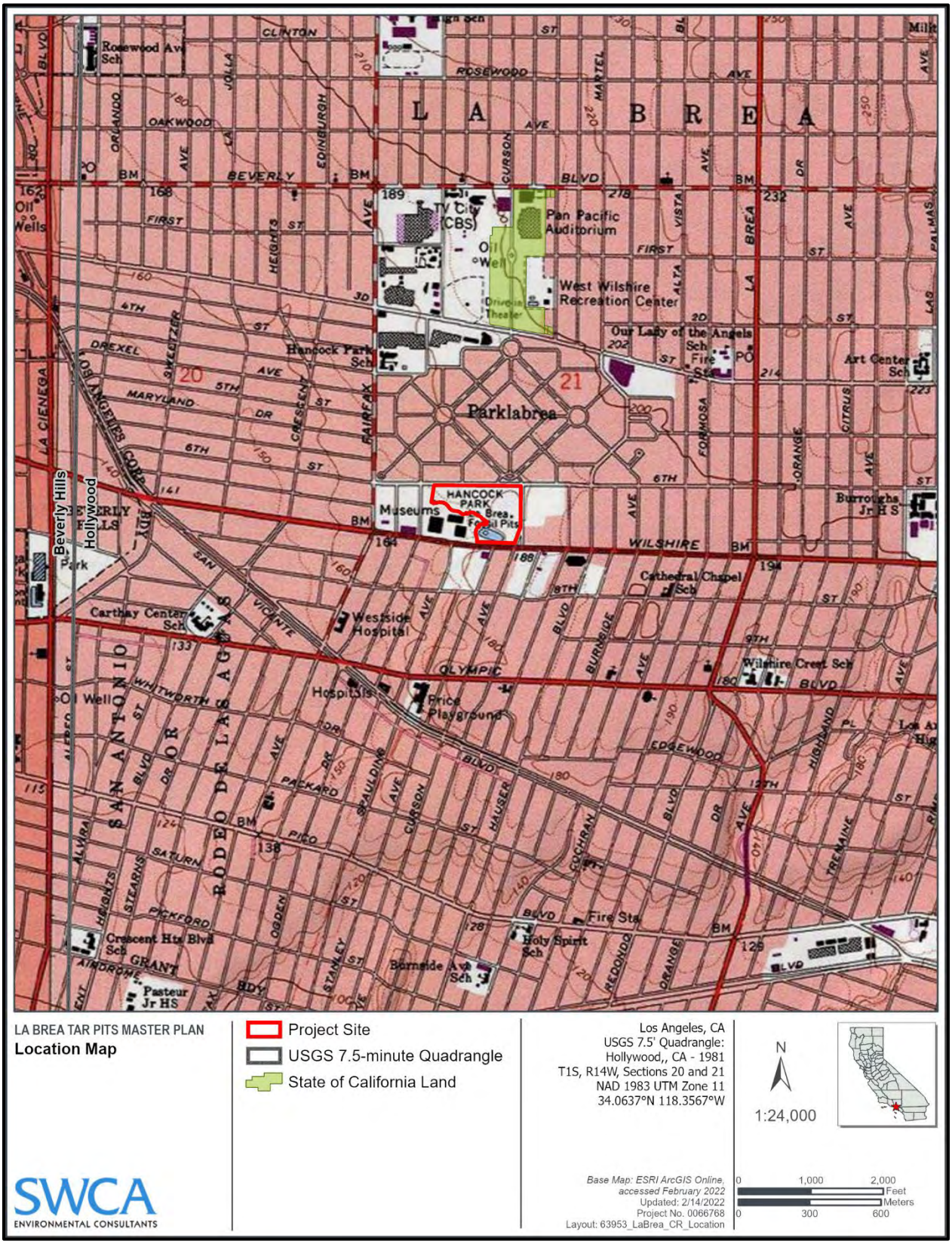


Figure 3. Project site shown on 2020 aerial photograph

Page Museum Renovations

The project would renovate the existing Page Museum to allow for enlarged exhibition space, additional storage, a ground floor café, and retail space (Figure 5 and Figure 6). The vegetation in the existing central atrium of the Page Museum would be removed to allow for the display of additional exhibitions and provide additional classroom and laboratory space (Figure 7). The enlarged collections storage could accommodate approximately 45,000 to 62,000 cubic feet of storage using a mixture of 7-foot-tall and 10-foot-tall compactors and open shelving. The final selection of storage systems and the layout would be developed through future phases of design. In addition, space for visiting researchers would be added.

The second floor of the Page Museum would contain two classrooms and a multipurpose space. An outdoor café and bar would be located next to these spaces on the center terrace on the west side of the Page Museum.

A sloped green roof would be installed to the north of the Page Museum and would curve to the west. The project would add extensive sustainability features to the Page Museum. In addition, the project would demolish the existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. A new 2,000-gross-square-foot (gsf) satellite maintenance and support building would be constructed for additional storage, administration, and research space directly west of the parking lot.

New Museum Building

A new two-story museum building would be located northwest of the Page Museum. The building would be approximately 40,000 gsf and would increase the total museum square footage to 104,000 gsf. The new museum building would be a maximum height of 30 feet. The new museum building would include an extended central lobby, exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock.

The Page Museum and new museum building would be continuously connected on the first floor (see Figure 5 and Figure 6). The first-floor central lobby would face southwest toward the Central Green and branch off into the Page Museum to the east and the new museum building to the west. An updated retail and café would be located off the lobby and look out over the Central Green. The buildings would be disconnected on the second floor, which would rise above the earthen berm. The separated facilities would be accessible through sloped outdoor walkways from the Central Green or interior staircases in the museum. There would be pedestrian entrances leading into the central lobby from the Central Green and from the parking lot. The existing Page Museum entrance would be converted to an educational group and tour entrance, which would be connected to a new school drop-off area on South Curson Avenue.

Figure 4. Proposed site plan, La Brea Tar Pits Master Plan

Figure 5. Proposed ground floor building program

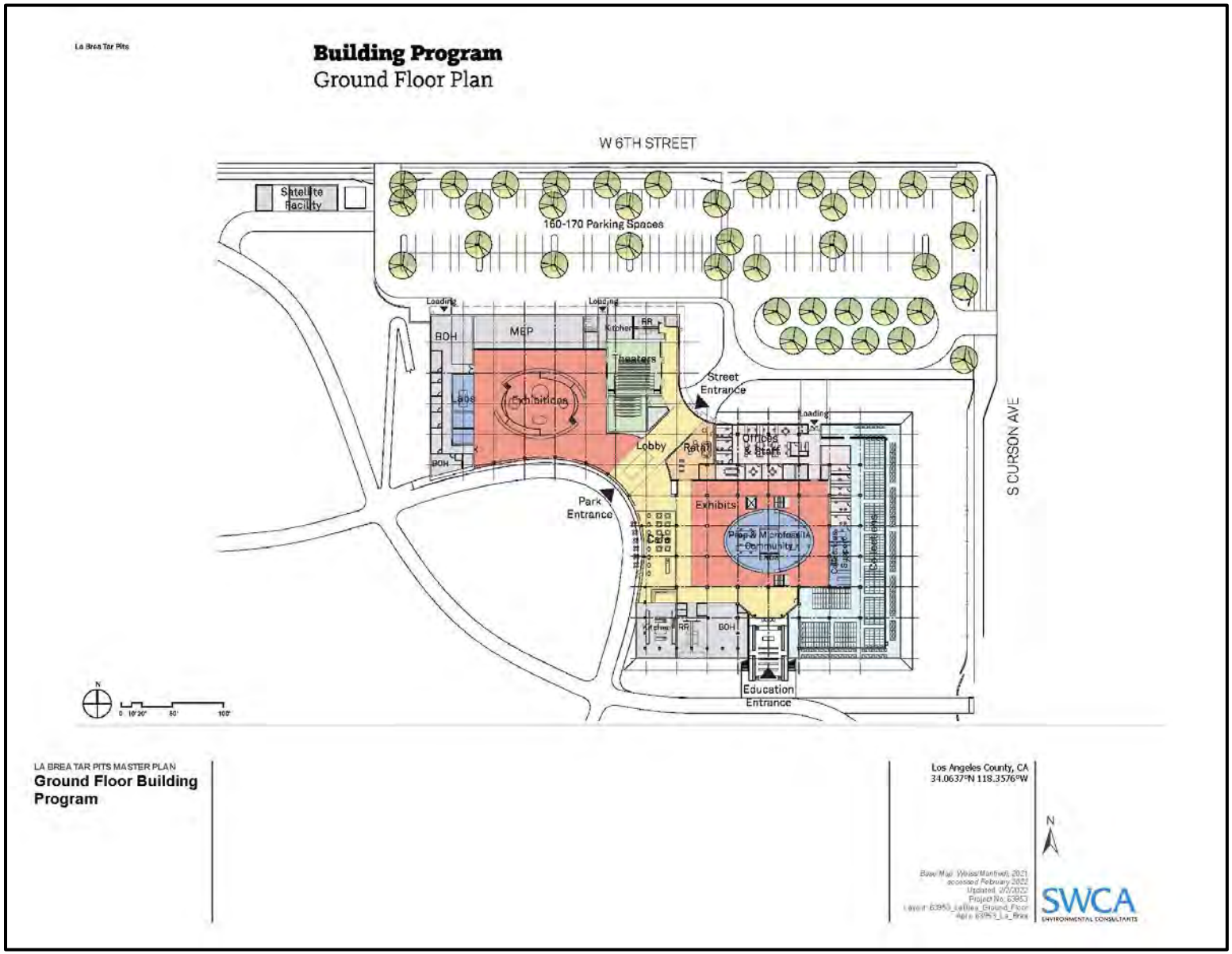


Figure 6. Proposed building program, promenade level plan

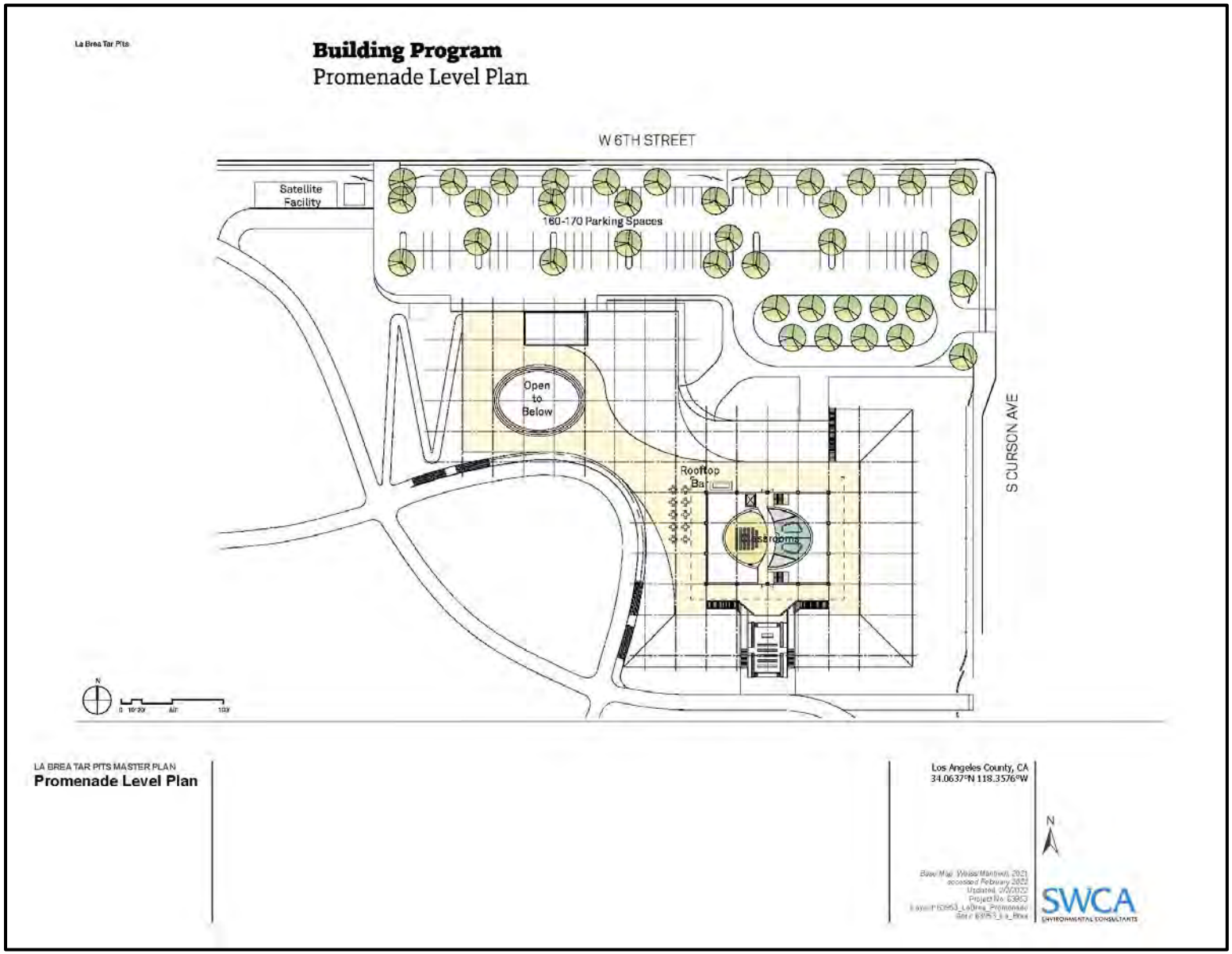
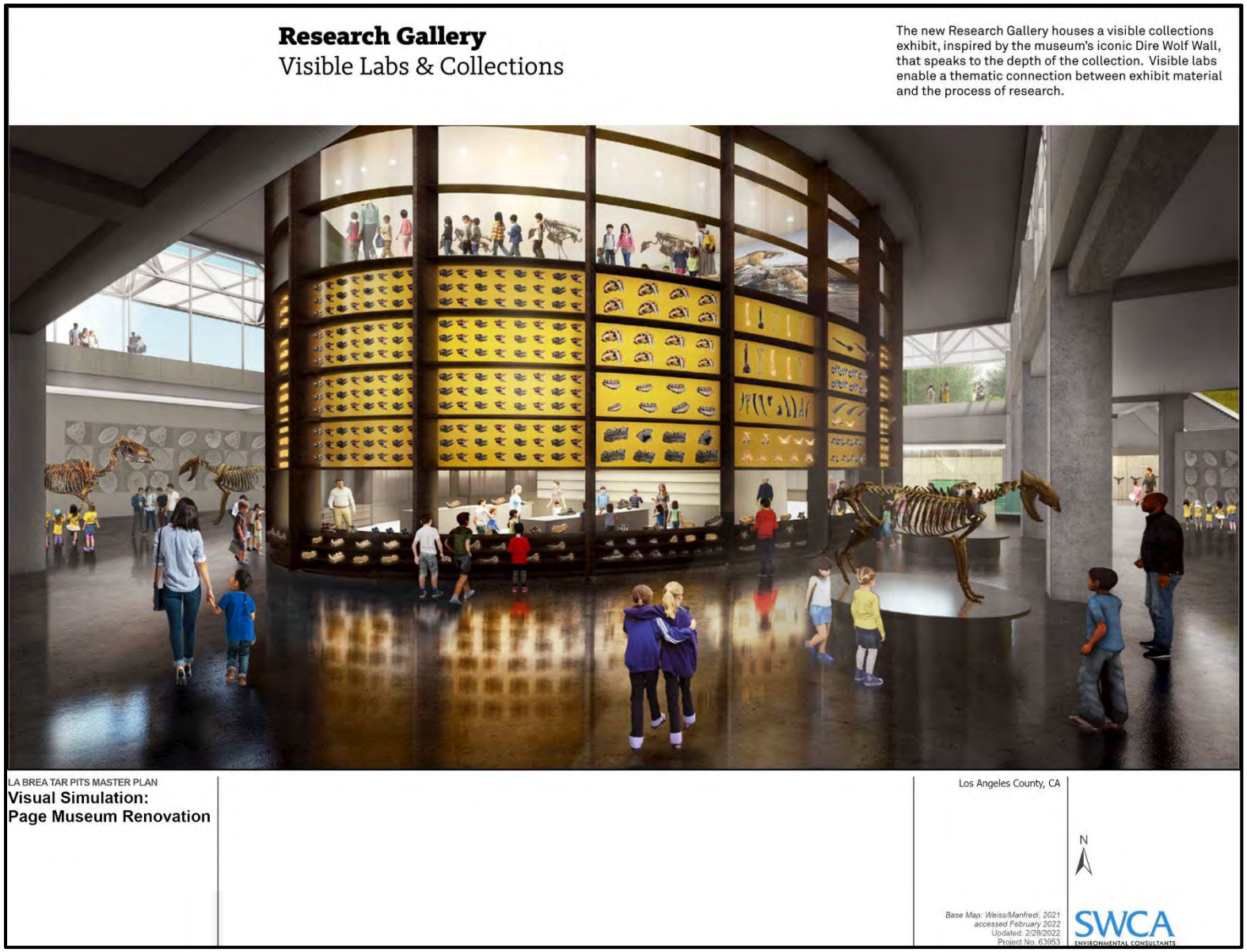


Figure 7. Visual simulation, Page Museum renovation



ADDED MUSEUM PROGRAMMING

All three existing theaters in the Page Museum would be renovated to serve as offices and collections storage. Two new theaters would be built in the new museum building. The project would replace the existing 3D Theater in the Page Museum, which is 1,120 square feet and contains 57 seats, and create a new Small Theater in the new museum building. The existing 2D Theater (1,630 square feet) and Ice Age Theater (1,540 square feet) in the Page Museum would be replaced by the Large Flexible Theater in the new museum building. The Large Flexible Theater would be 2,700 square feet and contain 170 to 190 removable seats.

Wilshire Gateway and Lake Pit

The project would renovate the existing entrance to the La Brea Tar Pits located at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza; this would provide orientation, spaces for gathering and queuing, and restrooms (Figure 8). A picnic area would also be located under the shaded canopy.

A pedestrian bridge and walking path would be constructed over the large tar lake, referred to in this study as the “Lake Pit,” with interpretive signage. Directly to the east of the Lake Pit, a new garden bioswale would be installed to manage stormwater and would include vegetation related to the Pleistocene era. The mammoths and mastodon sculptures would be relocated here.

6th Street Gateway

The project would renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA service drive. Similar to the Wilshire Gateway, a shaded canopy and welcome pavilion would provide orientation, legibility, and amenities. As a visible point of arrival from the residential communities to the north, this new entry would welcome visitors to a shaded park where recreational needs are balanced with the research activities of La Brea. Amenities would include play areas, picnic areas, seating and interpretation zones at the protected tar seeps, the gentle topography and bioswales along Lake Pit, and the revitalized destinations of the Dorothy Brown Amphitheater, Observation Pit, and Pit 91. Along the south edge of the loop path, connections would allow access to other Hancock Park programs and transportation connections.

Tar Pits

The project would renovate the existing facilities at all the tar pits in the northeastern portion of the project site (Figure 9). The extended chain fencing around Pit 9, Pit 13, and Pits 3, 4, 61, and 67 would be removed. The project would construct clearly defined viewing areas around each of the tar pits, with improved pit protection zones and fencing, seating, and interpretive signage. The project would relocate the wooden fossil boxes, research facilities, and ongoing excavation associated with Project 23 to space within and adjacent to the new museum building. The temporary storage and research buildings adjacent to Project 23 would be demolished or repurposed within the project site.

Pit 91 would continue to be a key research and interpretation destination in the park (Figure 10 and Figure 11). The project would demolish the current viewing station overlooking Pit 91 and construct a shaded outdoor classroom with canopy. While excavation at Pit 91 could be completed in a few years, the site would be maintained and enhanced to support future excavation and education opportunities. In addition, the new support facilities at Pit 91 would continue to support temporary excavation sites at adjacent Pit 10 or other future field sites.

Figure 8. Proposed Wilshire Gateway

Figure 9. Visual simulation, tar pits

Figure 10. Visual simulation, Pit 10 and Pit 91, outdoor classroom

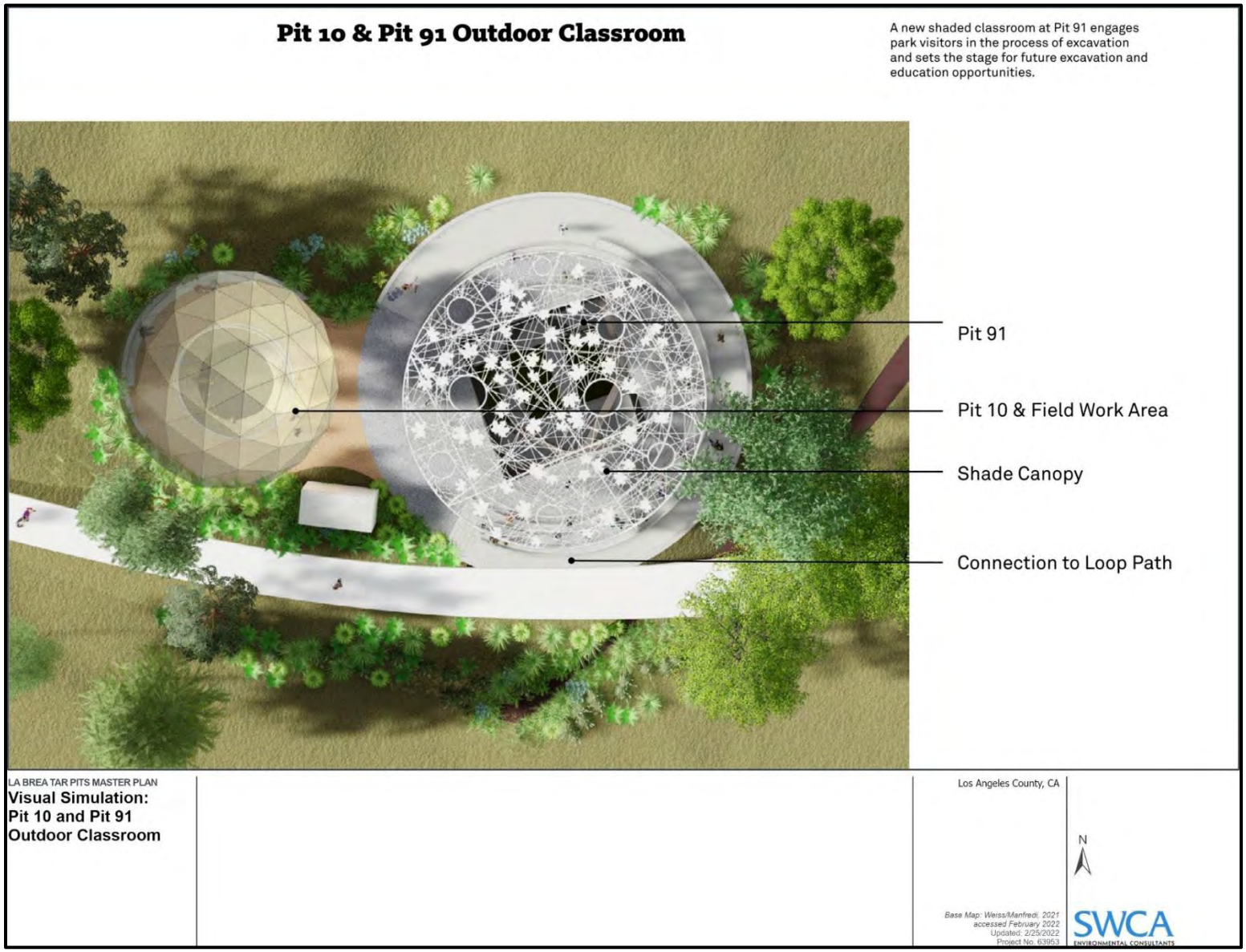
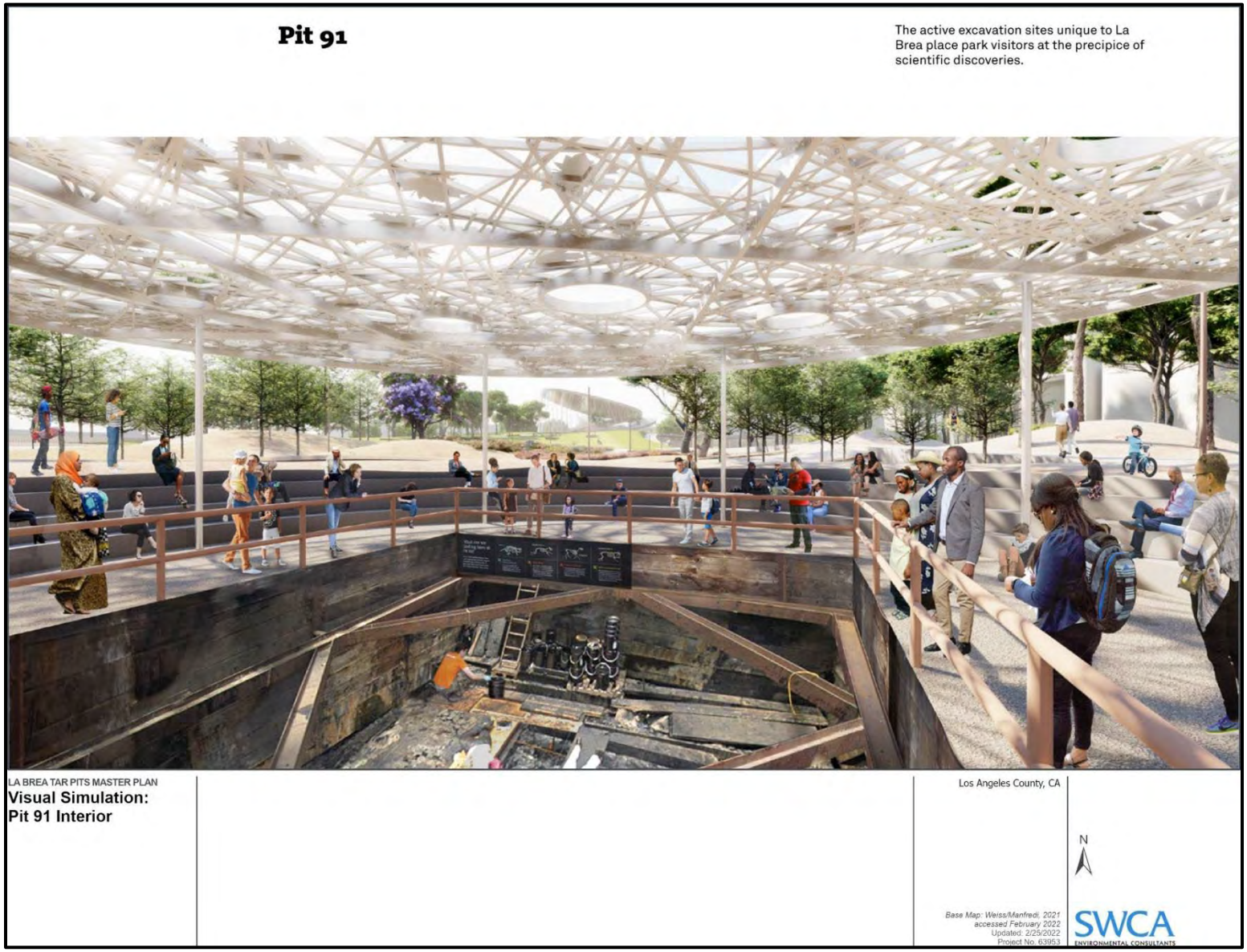


Figure 11. Visual simulation, Pit 91 interior



Pedestrian Path and Recreation

The project would reconfigure the existing pedestrian pathways on-site into a continuous 1-kilometer paved pedestrian path linking the disparate existing elements of the site: the Lake Pit and Wilshire Gateway in the southeast, Central Green, museum, tar seeps, and 6th Street Gateway in the northwest. The path would feature three distinct loops, each one reflecting distinct themes (Figure 12).

The Central Green would be at the center of the project site, directly to the southwest of the Page Museum and new museum building. This large common grass lawn provides a setting for community activities, recreation, events, and public gathering. The project would improve the infrastructure to create a drivable path for food trucks to access the Central Green. To the west of the 6th Street Gateway, the project would add a children's play area, picnic areas, and a small dog park. Vegetated berms around recreation areas would create seating areas and elevated vantage points.

Landscaping

As shown in Figure 13, the planting and landscaping concept for Hancock Park is divided into three distinct zones encircled by the looping path system. Each loop of the pedestrian path has its own usage and distinguishing theme representing different geologic epochs—Pleistocene in the southeastern loop, Holocene in the northwestern loop, and Anthropocene in the central loop. As noted above, the Pleistocene Garden would be approximately 10,000-11,000 square feet in size, located directly east of the Lake Pit, and incorporate a biofiltration area to help manage stormwater. It would be planted with herbaceous and woody species. The western loop would consist of a Holocene landscape with climate-appropriate native plantings to ease water consumption, ensure appropriate maintenance, and promote sustainable growth. A forested woodland consisting of Torrey Pine and Coast Live Oak would be planted with the intention of providing a focal area and shade. The western loop also contains Oil Creek, which will be developed into a biofiltration zone for stormwater management and would be planted with Sequoia and Monterey Pine trees in wetter pockets. The Central Lawn would be a common lawn.

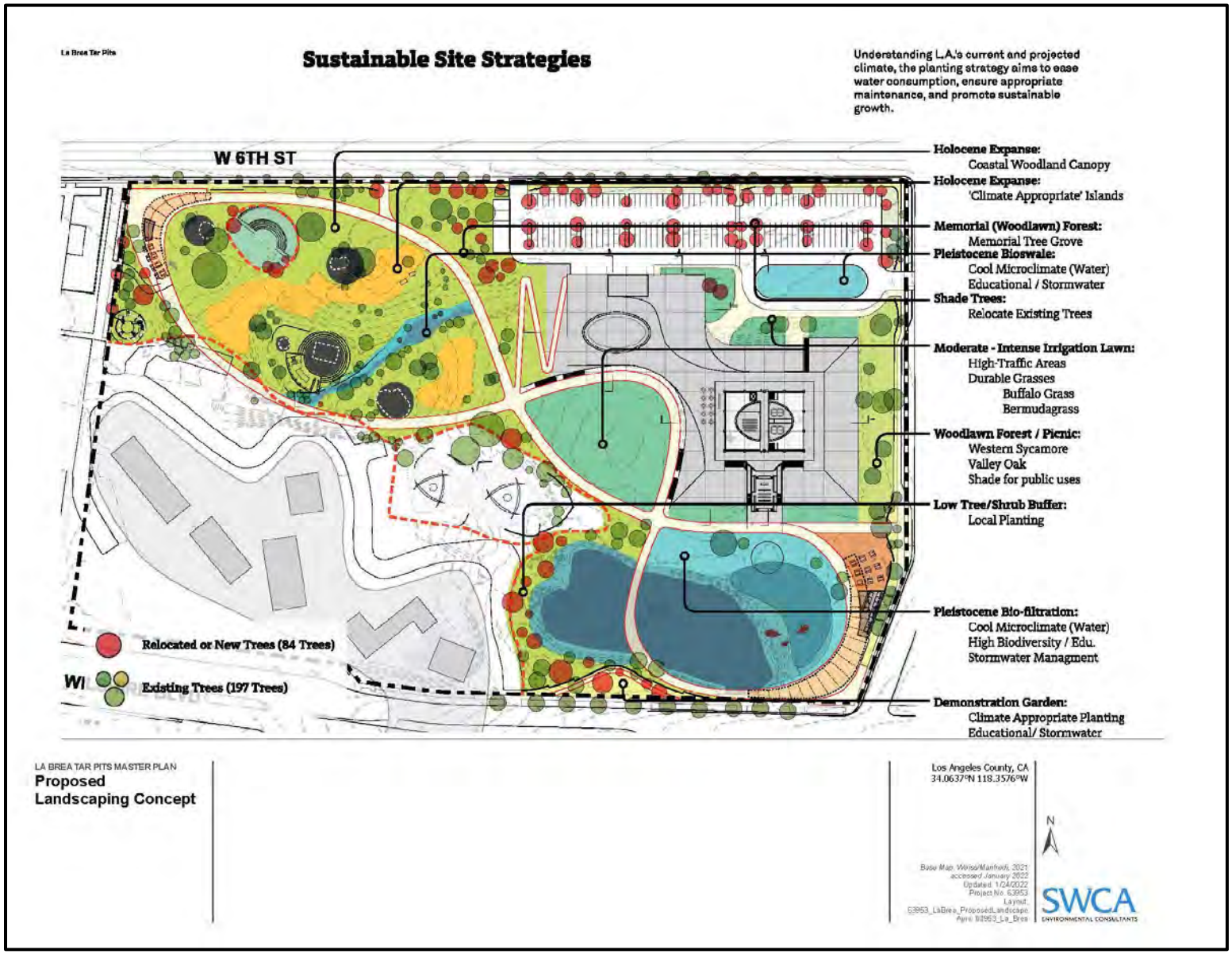
The woodland forest zone of the western loop would be extended along the park’s peripheral edges (northern, southern, eastern, and western) to provide shade to the picnic areas and the parking lot to the north. Tree species are expected to include Torrey Pine, Coast Live Oak, Western Sycamore, and Valley Oak and would support the development of a unified canopy across the site.

As stated above, there are 197 trees currently on the project site. The planting strategy includes the introduction or relocation of approximately 84 trees on-site. The relocated trees would be from existing locations within the project site. New plantings would be consistent with the planting and landscape concept and plant palette included in the Master Plan. New plantings would be selected for resilience to disease and with consideration for their ability to create shaded areas at the park. Trees that would be removed include non-native trees and/or trees that have been diseased or are not in good health. Species such as the Western Sycamore, California Buckeye, and Redwood would be preserved, unless they are diseased or in locations where new built features are planned, specifically the museum expansion and shifted parking lot on the northern side of the site. If healthy, these trees could be moved to the west of the parking lot, adjacent to the maintenance and support building.

At this juncture of the planning process, a tree assessment and landscaping plan have not been developed. More detailed plans for tree removal and planting would not be developed until after the EIR is completed.

Figure 12. Visual simulation, pedestrian pathway

Figure 13. Proposed landscaping concept



Circulation and Vehicle Parking

The existing parking lot would be expanded from 63,000 square feet to 65,000 square feet and shifted to the northeast corner of Hancock Park. The parking lot would hold approximately 160 to 170 vehicle parking spaces, an increase of approximately 5 to 15 spaces. The project would add new landscaping and vehicle access lanes to the parking lot. A vehicular drop-off loop would facilitate vehicle circulation and visitor entry through a pedestrian entrance to the museum leading from the parking lot.

Three loading and service entrances would accommodate deliveries for labs, exhibition material, food service, events, and staff offices. Two of the entrances would be from the parking lot into the new museum building on the north side, the third entrance would be from the parking lot into the Page Museum, also on the north side.

The proposed project includes a new school drop-off area from South Curson Avenue, adjacent to Wilshire Gateway picnic area. This inset loading area would accommodate school buses. School buses would also be able to access the parking lot from South Curson Avenue and drop-off in the loading area in the parking lot.

3. REGULATORY SETTING

This regulatory framework section identifies the federal, state, and local laws, statutes, guidelines, and regulations that govern the identification and treatment of cultural resources as well as the analysis of potential impacts to cultural resources. The lead agency must consider the provisions and requirements of this regulatory framework when rendering decisions on projects that have the potential to affect cultural resources.

Federal Regulations

National Historic Preservation Act of 1966

Enacted in 1966 and amended in 2000, the National Historic Preservation Act (NHPA) instituted a multifaceted program, administered by the Secretary of the Interior, to encourage sound preservation policies of the nation's cultural resources at the federal, state, and local levels. The NHPA authorized the expansion and maintenance of the National Register of Historic Places (NRHP), established the position of State Historic Preservation Officer and provided for the designation of State Review Boards, set up a mechanism to certify local governments to carry out the goals of the NHPA, assisted Native American tribes to preserve their cultural heritage, and created the Advisory Council on Historic Preservation.

National Register of Historic Places

The NRHP was established by the NHPA of 1966 as "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 Code of Federal Regulations [CFR] 60.2). The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials,

workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

- Criterion A: It is associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B: It is associated with the lives of persons who are significant in our past;
- Criterion C: It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; and/or
- Criterion D: It has yielded, or may be likely to yield, information important in prehistory or history.

Ordinarily cemeteries, birthplaces, or graves of historic figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, and properties that are primarily commemorative in nature, are not considered eligible for the NRHP, unless they satisfy certain conditions. In general, a resource must be 50 years of age to be considered for the NRHP, unless it satisfies a standard of exceptional importance.

In addition to meeting these criteria, a property must retain historic integrity, which is defined in National Register Bulletin 15 as the "ability of a property to convey its significance." [2] In order to assess integrity, the National Park Service recognizes seven aspects or qualities that, considered together, define historic integrity.

To retain integrity, a property must possess several, if not all, of these seven qualities, which are defined in the following manner in National Register Bulletin 15:

1. Location – the place where the historic property was constructed or the place where the historic event occurred;
2. Design – the combination of elements that create the form, plan, space, structure, and style of a property;
3. Setting – the physical environment of a historic property;
4. Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
5. Workmanship – the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;
6. Feeling – a property's expression of the aesthetic or historic sense of a particular period of time;
7. Association – the direct link between an important historic event or person and a historic property.

For the purposes of this study's indirect impact analysis, the aspects of setting and feeling are of particular relevant for this discussion; areas of particular relevance are highlighted below. The National Park Service defines the quality of setting in the following way:

> Setting is the physical environment of a historic property. Whereas location refers to the specific place where a property was built or an event occurred, setting refers to the character

[2] National Park Service (NPS). 1990. *National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation*, p. 44. Washington, D.C.: U.S. Department of the Interior, National Park Service.

> of the place in which the property played its historical role. It involves how, not just where, the property is situated and its relationship to surrounding features and open space.
>
> Setting often reflects the basic physical conditions under which a property was built and the functions it was intended to serve. In addition, the way in which a property is positioned in its environment can reflect the designer's concept of nature and aesthetic preferences.
>
> The physical features that constitute the setting of a historic property can be either natural or manmade, including such elements as: Topographic features (a gorge or the crest of a hill); vegetation; simple manmade features (paths or fences); and relationships between buildings and other features or open space.
>
> These features are their relationships should be examined not only within the exact boundaries of the property, but also between the property and its surroundings. This is particularly important for districts.[3]

The National Park Service defines the quality of feeling in the following way:

> Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, taken together, convey the property's historic character.[4]

National Natural Landmarks Program

Authorized by the Historic Sites, Buildings and Antiquities Act, the National Natural Landmarks program is administrated by the National Park Service for resources located on federal, state, or local lands. As codified in 36 CFR 62, the National Natural Landmarks program seeks to encourage the identification, study, designation, recognition, and preservation of nationally significant ecological and geological resources that reflect the nation's natural heritage (including paleontological/fossil-based resources).

State Regulations

The policies of the NHPA are implemented at the state level by the California Office of Historic Preservation, a division of the California Department of Parks and Recreation. The Office of Historic Preservation is also tasked with carrying out the duties described in the PRC and maintaining the California Historic Resources Inventory and California Register of Historical Resources (CRHR). The state-level regulatory framework also includes CEQA, which requires the identification and mitigation of substantial adverse impacts that may affect the significance of eligible historical resources.

California Register of Historical Resources

Created in 1992 and implemented in 1998, the CRHR is, according to PRC Sections 21083.2 and 21084.1, "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of

[3] NPS, 1990, p. 45.

[4] NPS, 1990, p. 45.

Historical Interest program, identified as significant in historical resources surveys or designated by local landmarks programs, may be nominated for inclusion in the CRHR.

According to PRC Section 5024.1(c), a resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:

Criterion 1: It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

Criterion 2: It is associated with the lives of persons important in our past;

Criterion 3: It embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of a master or possesses high artistic values;

Criterion 4: It has yielded, or may be likely to yield, information important in history or prehistory.

Resources nominated to the CRHR must retain enough of their historic character or appearance to convey the reasons for their significance. Resources whose historic integrity does not meet NRHP criteria may still be eligible for listing in the CRHR.

California Environmental Quality Act

CEQA requires a lead agency to analyze whether historical resources may be adversely impacted by a proposed project. Under CEQA, a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. Answering this question is a two-part process: first, the determination must be made as to whether the proposed project involves historical resources. Second, if historical resources are present, the proposed project must be analyzed for a potential substantial adverse change in the significance of the resource.

According to CEQA Guidelines Section 15064.5, for the purposes of CEQA, historical resources are:

1. A resource listed in, or formally determined eligible for listing in, the California Register of Historical Resources (PRC 5024.1, Title 14 CCR, Section 4850 et seq);
2. A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in a historical resources survey meeting the requirements of Section 5024.1(g) of the PRC;
3. Any building, structure, object, site, or district that the lead agency determines eligible for national, state, or local landmark listing; generally, a resource shall be considered by the lead agency to be historically significant (and therefore a historical resource under CEQA) if the resource meets the criteria for listing on the California Register (as defined in PRC Section 5024.1, Title 14 CCR, Section 4852).

According to CEQA Guidelines Section 15064.5 and PRC Section 5024.1, the fact that a resource is not listed or determined eligible for listing in the California Register or is not included in a local register or survey shall not preclude the lead agency from determining that the resource may be an historical resource. According to CEQA Guidelines Section 15064.5(b), a project with an effect that may cause a substantial adverse change in the significance of a historical resource may have a significant effect on the environment.

SUBSTANTIAL ADVERSE CHANGE TO HISTORICAL RESOURCES

CEQA Guidelines Section 15064.5 specifies that "substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." Material impairment occurs when a project alters in an adverse manner or demolishes "those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion" or eligibility for inclusion in the NRHP, CRHR, or local register. In addition, pursuant to CEQA Guidelines Section 15126.2, the "direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects."

CEQA Guidelines Section 15064(d) further defines direct and indirect impacts in the following manner:

1. A direct physical change in the environment is a physical change in the environment which is caused by and immediately related to the project.
2. An indirect physical change in the environment is a physical change in the environment, which is not immediately related to the project, but which is caused indirectly by the project. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect physical change in the environment.
3. An indirect physical change is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project.

SECRETARY OF THE INTERIOR'S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES

In accordance with CEQA Guidelines and 14 CCR Section 15126.4(b)(1), a project that has been determined to conform with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Secretary's Standards*) is generally considered a project that will not cause a significant adverse impact to historical resources. The *Secretary's Standards* and associated Guidelines are not "prescriptive but are intended to promote responsible preservation practices."[5] The standards offer recommendations for maintaining, repairing, and replacing historic features, as well as for designing additions.

As developed by the National Park Service, the *Secretary's Standards* consist of four related treatment approaches: preservation, rehabilitation, restoration, and reconstruction. It is anticipated that rehabilitation would be the appropriate approach for the proposed project. Rehabilitation, which is the most flexible treatment approach of the four, is defined as the process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

The 10 *Secretary's Standards for Rehabilitation* are:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

[5] Weeks, K.D., and A.E. Grimmer. 2001. *Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings*. Washington, D.C.: U.S. Department of the Interior. Available at: http://www.nps.gov/tps/standards/rehabilitation/rehabilitation-guidelines.pdf. Accessed July 11, 2022.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Secretary's Standards compliance begins with the identification and documentation of the "character-defining," or historically significant, features of the historical resource. According to *Preservation Brief 17, Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character*, identifying character-defining features consists of a three-step process.[6] Step 1 involves assessing the physical aspects of the building exterior as a whole, including its setting, shape and massing, orientation, roof and roof features, projections, and openings. Step 2 looks at the building more closely—at materials, trim, secondary features, and craftsmanship. Step 3 encompasses the interior, including individual spaces, sequences of spaces, finishes and materials.

In 2017, the National Park Service issued an update to the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*.[7] The updated document includes additional, project-specific detail on how to comply with and implement the *Secretary's Standards*. Table 1 summarizes the recommendations

[6] Nelson, L.H., FAIA. 1982. *Preservation Briefs #17: Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character*. U.S. Department of the Interior, National Park Service. Available at: https://www.nps.gov/tps/how-to-preserve/briefs/17-architectural-character.htm. Accessed July 11, 2022.

[7] Grimmer, A.E. 2017. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*. U.S. Department of the Interior, National Park Service, Technical Preservation Services.

for historic building sites that are of particular relevance to the proposed project. Table 2 summarizes the recommendations for significant settings of historic districts and neighborhoods.

Table 1. *Standards for Rehabilitation*, Recommended Treatments for Historic Building Sites[8]

Recommended	Not Recommended
Identifying, retaining, and preserving features of the building site that are important in defining its overall historic character. Site features may include 1) walls, fences, or steps; circulation systems, such as walks, paths or roads; 2) vegetation, such as trees, shrubs, grass, orchards, hedges, windbreaks, or gardens; 3) landforms, such as hills, terracing, or berms; 4) furnishings and fixtures, such as light posts or benches; 5) decorative elements, such as sculpture, statuary, or monuments; 6) water features, including fountains, streams, pools, lakes, or irrigation ditches; and 7) subsurface archaeological resources, other cultural or religious features, or burial grounds which are also important to the site.	Removing or substantially changing buildings and their features or site features which are important in defining the overall historic character of the property so that, as a result, the character is diminished.
Retaining the historic relationship between buildings and the landscape	Removing or relocating buildings or landscape features, thereby destroying the historic relationship between buildings and the landscape. Removing or relocating buildings on a site or in a complex of related historic structures (such as a mill complex or farm), thereby diminishing the historic character of the site or complex. Moving buildings onto the site, thereby creating an inaccurate historic appearance. Changing the grade level of the site if it diminishes its historic character. For example, lowering the grade adjacent to a building to maximize use of a basement, which would change the historic appearance of the building and its relation to the site.
Protecting and maintaining buildings and site features by providing proper drainage to ensure that water does not erode foundation walls, drain toward the building, or damage or erode the landscape	Failing to ensure that site drainage is adequate so that buildings and site features are damaged or destroyed; or, alternatively, changing the site grading so that water does not drain properly
Minimizing disturbance of the terrain around buildings or elsewhere on the site, thereby reducing the possibility of destroying or damaging important landscape features, archaeological resources, other cultural or religious features, or burial grounds	Using heavy machinery or equipment in areas where it may disturb or damage important landscape features, archaeological resources, other cultural or religious features, or burial grounds
Protecting buildings and landscape features when working on the site	Failing to protect building and landscape features during work on the site or failing to repair damaged or deteriorated site features
Designing new onsite features…when required by a new use, so that they are as unobtrusive as possible, retain the historic relationship between the building or buildings and the landscape, and are compatible with the historic character of the property Designing new exterior additions to historic buildings or adjacent new construction that are compatible with the historic character of the site and preserves the historic relationship between the building or buildings and the landscape.	Introducing new construction on the building site which is visually incompatible in terms of size, scale, design, material, or color, which destroys historic relationships on the site

[8] Grimmer, 2017, pp. 137–142.

Table 2. *Standards for Rehabilitation*, Recommended Treatments for Setting (Districts)[9]

Recommended	Not Recommended
Identifying, retaining, and preserving building and landscape features that are important in defining the overall historic character of the setting. Such features can include 1) circulation systems, such as roads and streets; 2) furnishing and fixtures, such as light posts or benches; 3) vegetation, gardens and yards; 4) adjacent open space, such as fields, parks, commons, or woodlands; and 5) important views or visual relationships.	Removing or substantially changing those building and landscape features in the setting which are important in defining the historic character so that, as a result, the character is diminished.
Retaining the historic relationship between buildings and landscape features in the setting. For example, preserving the relationship between a town common or urban plaza and the adjacent houses, municipal buildings, roads, and landscape and streetscape features.	Altering the relationship between the buildings and landscape features in the setting by widening existing streets, changing landscape materials, or locating new streets or parking areas where they may negatively impact the historic character of the setting. Removing or relocating buildings or landscape features, thereby destroying the historic relationship between buildings and the landscape in the setting.
Protecting buildings and landscape features when undertaking work in the setting	Failure to protect buildings and landscape features during work in the setting
Evaluating the overall condition of materials and features to determine whether more than protection and maintenance, such as repairs to materials and features in the setting, will be necessary	Failing to undertake adequate measures to ensure the protection of materials and features in the setting.
Repairing features in the setting by reinforcing the historic materials. Repairs may include the replacement in kind or with a compatible substitute material of those extensively deteriorated or missing parts of setting features when there are surviving prototypes, such as fencing, paving materials, trees, and hedgerows. Repairs should be physically and visually compatible.	Failing to repair and reinforce damaged or deteriorated historic materials and features in the setting. Removing material that could be repaired or using improper repair techniques. Replacing an entire feature of the building or landscape in the setting when repair of materials and limited replacement of deteriorated or missing components are feasible
Designing new exterior additions to historic buildings or adjacent new construction that are compatible with the historic character of the setting that preserve the historic relationship between the buildings and the landscape.	Introducing new construction into historic districts which is visually incompatible or that destroys historic relationships within the setting, or which damages or destroys important landscape features
Removing non-significant buildings, additions, or landscape features which detract from the historic character of the setting	Removing a historic building, a building feature, or landscape feature which is important in defining the historic character of the setting.

Local Regulations

County of Los Angeles

HISTORIC PRESERVATION ORDINANCE

In September 2015, the County of Los Angeles (County) Board of Supervisors adopted a Historic Preservation Ordinance (HPO) and Mills Act Program for all unincorporated territories of the County. As stated by the County Department of Regional Planning, the HPO:

- Specifies criteria and procedures for the designation of landmarks and historic districts;
- Specifies criteria and procedures for reviewing proposed work on designated landmarks or on property within historic districts;
- Establishes penalties for unauthorized work, including demolition, on landmarks or historic district contributors;

[9] Grimmer, 2017, pp. 143–146.

- Requires maintenance of landmarks and historic district contributors to prevent deterioration;
- Prohibits work, including demolition, on property nominated but not yet designated as a landmark or historic district;
- Encourages adaptive reuse of landmarks and historic district contributors by providing relief from parking requirements;
- Provides for the enhancement of historic districts by the establishment of development guidelines and standards, and by allowing streetscape improvements that are compatible with the areas historic character.[10]

As codified in Chapter 22.124, the HPO established the County Register of Landmarks and Historic Districts, along with the following designation criteria in unincorporated communities of the County:

A. A structure, site, object, tree, landscape, or natural land feature may be designated as a landmark if it is 50 years of age or older and satisfies one or more of the following criteria:

    1. It is associated with events that have made a significant contribution to the broad patterns of the history of the nation, State, County, or community in which it is located;

    2. It is associated with the lives of persons who are significant in the history of the nation, State, County, or community in which it is located;

    3. It embodies the distinctive characteristics of a type, architectural style, period, or method of construction, or represents the work of an architect, designer, engineer, or builder whose work is of significance to the nation, State, County, or community in which it is located; or possesses artistic values of significance to the nation, State, County, or community in which it is located;

    4. It has yielded, or may be likely to yield, significant and important information regarding the prehistory or history of the nation, State, County, or community in which it is located;

    5. It is listed, or has been formally determined eligible by the United States National Park Service for listing, in the National Register of Historic Places, or is listed, or has been formally determined eligible by the State Historical Resources Commission for listing, on the California Register of Historical Resources;

    6. If it is a tree, it is one of the largest or oldest trees of the species located in the County; or

    7. If it is a tree, landscape, or other natural land feature, it has historical significance due to an association with an historic event, person, site, street, or structure, or because it is a defining or significant outstanding feature of a neighborhood.

B. Property less than 50 years of age may be designated as a landmark if it meets one or more of the criteria set forth in subsection A of this Section, and exhibits exceptional importance.

C. The interior space of a property, or other space held open to the general public, including but not limited to a lobby, may be designated as a landmark or included in the landmark designation of a property if the space qualifies for designation as a landmark under subsections A or B of this Section.

[10] Los Angeles County Department of Regional Planning. 2015. Historic Preservation Ordinance. Available at: https://planning.lacounty.gov/preservation/ordinance. Accessed July 11, 2022.

D. Historic districts. A geographic area, including a noncontiguous grouping of related properties, may be designated as an historic district if all of the following requirements are met:

    1. More than 50 percent of owners in the proposed district consent to the designation;

    2. The proposed district satisfies one or more of the criteria set forth in subsections A.1 through A.5, inclusive, of this Section; and

    3. The proposed district exhibits either a concentration of historic, scenic, or sites containing common character-defining features, which contribute to each other and are unified aesthetically by plan, physical development, or architectural quality; or significant geographical patterns, associated with different eras of settlement and growth, particular transportation modes, or distinctive examples of parks or community planning.

According to HPO Section 22.124.080, landmarks and historic districts may be nominated for designation through resolution by the Board of Supervisors or the Landmarks Commission. For purposes of this study, County criteria are applied to CEQA APE properties owned by the County of Los Angeles.

City of Los Angeles

Although the project site is located within the city of Los Angeles, it is owned by the County of Los Angeles and is proposed for uses that benefit the public. Accordingly, the proposed project is subject to the regulatory controls of the County of Los Angeles and not the City of Los Angeles. Areas adjacent to the project site are under the jurisdiction of the City. Consideration of the city-level regulatory framework in this study fulfills the intended purpose of CEQA as disclosing all relevant information associated with the proposed project.

LOS ANGELES HISTORIC-CULTURAL MONUMENTS

Local landmarks in the city are known as Historic-Cultural Monuments and are managed under the aegis of the City of Los Angeles Planning Department, Office of Historic Resources. Originally adopted in 1962, and most recently amended in 2018, the City of Los Angeles Cultural Heritage Ordinance establishes the criteria and process for designation of Historic-Cultural Monuments.

In accordance with Section 22.171.7, a Historic-Cultural Monument "is any site (including significant trees or other plant life located thereon), building, or structure of particular historical or cultural significance to the City of Los Angeles" that meets at least one of the following criteria:

1. Is identified with important events of national, state, or local history, or exemplifies significant contributions to the broad cultural, economic or social history of the nation, state, city or community;
2. Is associated with the lives of historic personages important to national, state, city, or local history; or
3. Embodies the distinctive characteristics of a style, type, period, or method of construction; or represents a notable work of a master designer, builder, or architect whose individual genius influenced his or her age.

In Los Angeles, the Cultural Heritage Commission may recommend approval or disapproval of applications for designation; this recommendation is made to the City Council, which may adopt a designation by majority vote.

HISTORIC PRESERVATION OVERLAY ZONES

Local historic districts in the city of Los Angeles are known as Historic Preservation Overlay Zones (HPOZ). As described by the City of Los Angeles Office of Historic Resources, the Historic Preservation Overlay Zone (HPOZ) Ordinance was adopted in 1979, and amended in 2004:

> To identify and protect neighborhoods with distinct architectural and cultural resources, the City … developed an expansive program of Historic Preservation Overlay Zones … HPOZs, commonly known as historic districts, provide for review of proposed exterior alterations and additions to historic properties within designated districts.

The project site does not fall within any HPOZ.

4. METHODOLOGY

The following section presents an overview of the methodology used in this report. To consider potential direct and indirect impacts to historical resources, the CEQA Area of Potential Effects (CEQA APE) consists of parcels within and directly adjacent to the proposed project footprint (Figure 14).

Research and Literature Review

To characterize all properties within the CEQA APE, SWCA conducted primary- and secondary-source research in a wide variety of collections. A phase of literature review of previous studies was completed, and data gaps were identified to guide research efforts. Research focused on a variety of materials relating to the history and development of the project site and its role in the history of institutional/cultural development in Los Angeles. Materials consulted included historical maps, photographs, and newspapers; aerial and ground-based photographs; publications and journal articles; among other materials. Sources included the following publicly accessible collections:

- City of Los Angeles Office of Historic Resources (Historic-Cultural Monuments, SurveyLA)
- David Rumsey Historical Map Collection
- Environmental Data Resources, Inc.
- Huntington Library Digital Archives
- Library of Congress
- Combined collections of Los Angeles Public Library and University of Southern California libraries
- Sanborn Fire Insurance Company Maps
- U.S. Geological Survey (USGS) historical topographic maps
- University of California, Santa Barbara Digital Library

For the purposes of this investigation, the results of Los Angeles's citywide historical resources survey undertaking, SurveyLA, for the Wilshire Community Plan Area were used for all properties falling within the CEQA APE, unless a preponderance of evidence suggested that alternative conclusions were more appropriate.

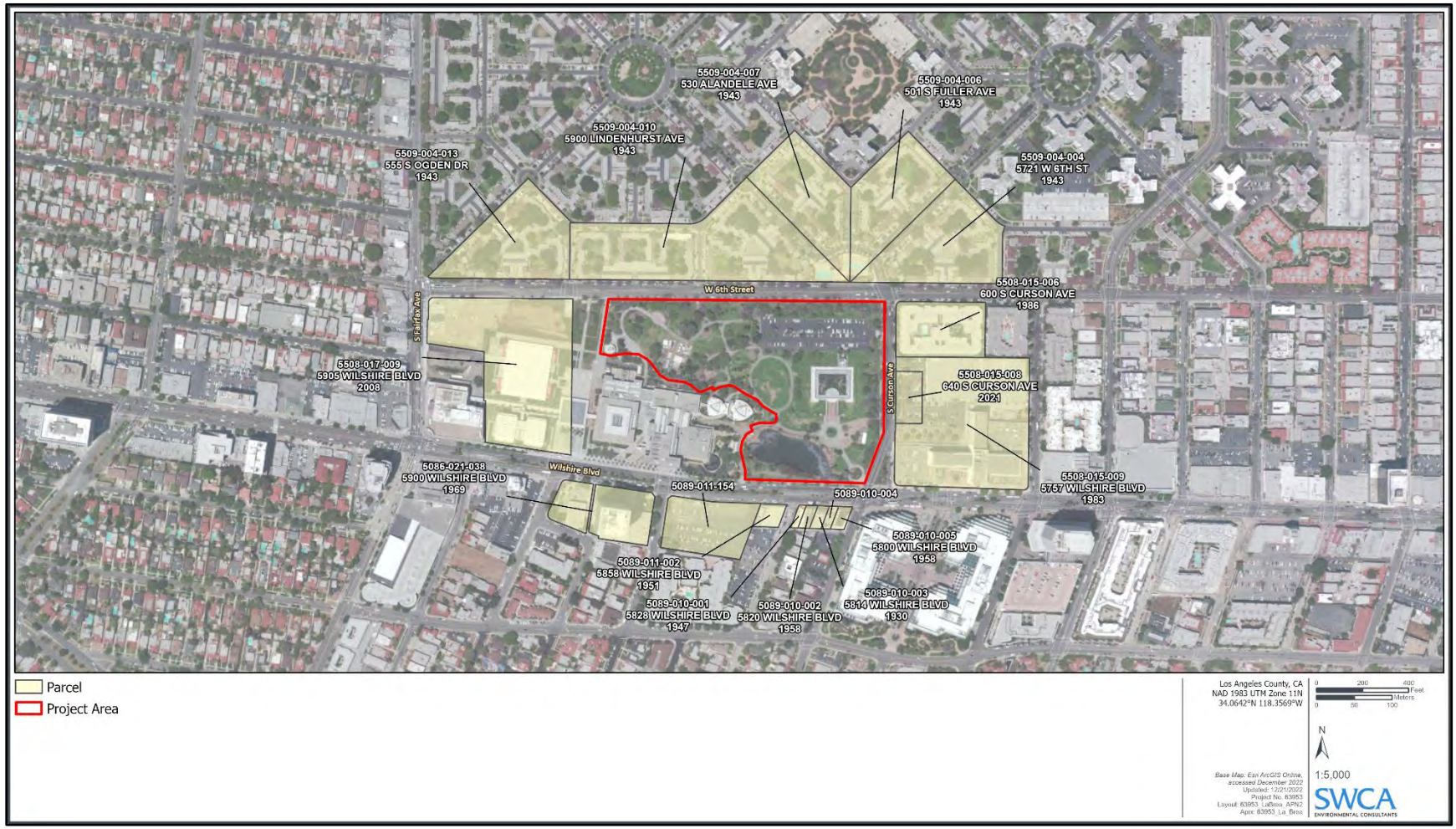
Field Survey and Project Team Coordination

To accurately assess the proposed project, SWCA met with the Foundation and the design team to review project drawings, architectural plans, and site design concepts. Field surveys took place in February 2022 and July 2022. Properties within the CEQA APE were inspected and photographed. Digital photography and field notes allowed for a thorough depiction of the subject properties and their existing conditions. Figure 15 shows the target properties included in the field survey.

Subject properties were assigned the appropriate California Historical Resources (CHR) status code (full results are presented in Section 6, Historical Resources Survey and Results). The principal elements of the proposed project were studied for potential direct and indirect impacts to historical resources pursuant to CEQA. Those results are presented in Section 7 (Impacts Analysis).

Figure 14. CEQA APE, with project footprint enclosed in red, and broader APE in yellow

Figure 15. Target properties, addresses, and dates of construction, historical resources survey area



5. HISTORIC SETTING AND CONTEXT

National Register Bulletin 24, *Guidelines for Local Surveys*, states that the historic context developed in support of historical resource surveys should analyze and describe the "broad pattern of historical development in a community or its region that may be represented by historic resources."[11] Developing a historic context for survey areas is further described by the National Register as vital for providing a basis for any assessment, helping researchers successfully identify all significant resources and helping eliminate unintended biases. Through a review of the history of the state and region under consideration, the historic context should define important patterns of development that may be reflected in the area's historical resources.

The National Register defines context as "a body of information about our history according to the stages of development occurring at various times and places."[12] Theme, place, and time are the basic elements that define historic context. The context statement incorporates stages of physical development, including the evolution of building forms and architectural style, as well as highlighting facets of industries or events.

Historic context is also linked to the built environment through the concept of property type. A property type is "a grouping of individual properties based on a set of shared physical or associative characteristics. Physical characteristics may relate to structural forms, architectural styles, building materials, or site type. Associative characteristics may relate to the nature of associated events or activities, to associations with a specific individual or group of individuals."[13] Historic contexts, therefore, become a useful tool for gauging the relative importance and integrity of properties.

The following context draws on available sources and archival research to offer an overview of the regional and site-specific historic context. Material specific to the project site and surrounding areas, including the Wilshire Boulevard "Miracle Mile," Hancock Park, and the larger Wilshire Community Plan Area is drawn from the City of Los Angeles Department of City Planning study, *Historic Resources Survey Report: Wilshire Community Plan Area*, prepared in 2015 by Architectural Resources Group, Inc., for the Office of Historic Resources.

City of Los Angeles: From Pueblo to City

On September 4, 1781, 44 settlers from Sonora, Mexico, accompanied by the governor, soldiers, mission priests, and several Native Americans, arrived at a site alongside the *Rio de Porciúncula* (later renamed the LA River).[14] They founded a pueblo called *La Reyna de los Angeles*, or the town of the Queen of the Angels.[15] By 1786, the area's abundant resources and the availability of little-compensated Native American labor allowed the pueblo to attain self-sufficiency, and funding by the Spanish government ceased.

Less than 1 month after the pueblo's founding, Los Angeles residents began constructing an extensive water management system. They diverted water from the river (near the present North Broadway bridge) into a ditch named the *Zanja Madre* (mother ditch), which in turn fed numerous smaller zanjas. The city's

[11] U.S. Department of the Interior, National Park Service. 1985 [1977]. *National Register Bulletin 24, Guidelines for Local Surveys: A Basis for Preservation Planning.* Washington, D.C. Available at: http://www.cr.nps.gov/nr/publications/bulletins/nrb24/chapter1.htm.

[12] NPS, 1990, p. 7.

[13] National Park Service (NPS). 1997. *National Register Bulletin 16B: How to Complete the National Register Multiple Property Documentation Form*, p. 14. Washington, D.C.: U.S. Department of the Interior, National Park Service.

[14] Ríos-Bustamante, A. 1992. *Mexican Los Angeles: A Narrative and Pictorial History*. Mountain View, California: Floricanto Press.

[15] Treutlein, T.E. 2004. Los Angeles, California: The Question of the City's Original Spanish Name. In *The Founding Documents of Los Angeles: A Bilingual Edition*, edited by Doyce B. Nunis Jr. Los Angeles, California: Historical Society of Southern California.

residents used this water for ranching and agriculture, as well as domestic purposes such as drinking, bathing, and clothes washing.[16] The Los Angeles zanja system was expanded and improved in subsequent decades and remained in use until the early 1900s, as many zanja segments were converted into masonry-lined canals, iron or cement pipes, or brick-lined, subsurface conduits.[17]

Following Mexican independence from Spain, the pueblo slowly grew in size, as the removal of economic restrictions attracted settlers to Los Angeles. The population continued to expand throughout the Mexican period, and, on April 4, 1850, only 2 years after the Mexican–American War and 5 months prior to California's earning statehood, the City of Los Angeles was formally incorporated. Los Angeles maintained its role as a regional business center in the early American period and the transition of many former rancho lands to agriculture, as well as the development of citriculture in the late 1800s, further strengthened this status.[18] These factors, combined with the expansion of port facilities and railroads throughout the region, contributed to the real estate boom of the 1880s in Los Angeles.[19, 20]

Part of this rapid expansion of Los Angeles was achieved through the marketing of Southern California and its Mediterranean climate, which enticed people of all economic means to relocate to the region. This included some of America's wealthiest individuals, who constructed residences as winter homes allowing them to escape the colder climates of the financial and industrial centers of the East Coast and Midwest. The development of new industries was also paramount to this growth during the late nineteenth and early twentieth centuries, specifically the production of oil, real estate development, citriculture, and the entertainment and film industry.

Los Angeles continued to grow outward from the city core in the twentieth century, in part due to oil production and to its strategic location as a wartime port. The military presence led to the aviation and eventually aerospace industries having a large presence in the city and region. Hollywood became the entertainment capital of the world through the presence of the film and television industries, and continues to maintain that position. These industries established a Los Angeles-centered elite that would be formative in the development of the region's first cultural institutions during the twentieth century, raising its prominence on the world stage. Through the continued promotion of the region through the motion picture and entertainment industry, growing tourism, and from hosting large-scale events, such as the Summer Olympic Games in 1932, Los Angeles had quickly become one of the world's great cities.

Today, with nearly 4 million residents, Los Angeles is the second largest city in the United States (by population), and it remains a city with worldwide influence, while continuing to struggle with its population's growth and needs. The early development of cultural and civic institutions in the city laid the groundwork for Los Angeles' current status as one of the leading cities for museums.

Development of Cultural Institutions in Los Angeles

Through the late nineteenth and early twentieth century, Los Angeles continued to expand both in terms of population growth and new construction; the development of cultural institutions to serve the growing population took root gradually. An early catalyst was the influx of new wealth, which spurred a variety of new museums, botanical gardens, and other cultural institutions. The trend of wealthy individuals as collectors, benefactors, and patrons would continue to be the predominant catalyst for the development of

[16] Newmark, H. 1977 [1915]. *Reminiscences of the Fifties. Los Angeles: Biography of a City*, edited by J. Caughey and L. Caughey, pp. 132–140. Berkeley: University of California Press.

[17] Costello, J.G., and L. Wilcoxon. 1978. *An Archaeological Assessment of Cultural Resources in Urban Los Angeles*. Prepared for the City of Los Angeles in connection with construction project La Placita de Dolores, LAN-887. On file at the South Central Coastal Information Center, California State University, Fullerton.

[18] Caughey, J., and L. Caughey (eds.) 1977. *Reminiscences of the Fifties. Los Angeles: Biography of a City*. Berkeley: University of California Press.

[19] Caughey and Caughey, 1977.

[20] Dumke, G.S. 1944. *The Boom of the Eighties in Southern California*. San Marino, California: Huntington Library Publications.

cultural institutions and museums throughout the history of Los Angeles, although some public partnerships would also contribute to this expansion.[21]

EARLY MUSEUMS AND INSTITUTIONS (1885–1941)

The first museum founded in Los Angeles was the Southwest Museum of the American Indian, which was established in 1907 by Charles F. Lummis. Lummis had famously trekked overland from Cincinnati to Los Angeles in 1884, where he became a reporter and eventual editor for the *Los Angeles Times*. A polymathic and somewhat larger-than-life character, Loomis was a self-described journalist, writer, artist, architect, photographer, and aspiring social scientist who was heavily influenced by his experiences in the Southwest and Southern California.[22]

In addition to being an early advocate for the preservation of the Spanish Missions, Lummis was outspoken about the treatment of the Native Americans and the eradication and erosion of indigenous cultures. Although not particularly wealthy, Lummis started to collect a variety of artifacts through his travels in the southwest, which included intricate woven baskets and other items to be displayed as part of the museum's collection. What he lacked in finances, Lummis made up for in his connections by networking with a variety of museums, organizations, and institutions throughout the United States with the aim of bolstering Los Angeles as a cultural center.

The fruit of these early efforts by Lummis was the Southwest Museum of the American Indian, constructed in 1912. The museum opened to the public in 1913 (Figure 16).[23]

Figure 16. Southwest Museum of the American Indian, ca. 1914

Source: Los Angeles Public Library

During this same period, the Los Angeles County Museum of History, Science, and Art was established. Constructed in Exposition Park and officially opened in 1913, the county museum was set within a grand Beaux Arts inspired building that housed a variety of collections, each within wings dedicated to history, science, and the fine arts. While some collections were slow to be amassed, namely the fine arts, others were quick to expand and outgrow the facilities (Figure 17).[24] This is particularly true of the science

[21] GPA Consulting. 2017. *Los Angeles County Museum of Art, Los Angeles, California – Historical Resources Technical Report*, p. 45.

[22] Burton, D. 2017. National Register of Historic Places Registration Form – Southwest Museum (Amendment), pp. 8.5–8.7. National Park Service.

[23] Burton, 2017.

[24] GPA Consulting, 2017, p. 46.

wing, which would largely house the wealth of prehistoric fossils removed from the tar pits at Rancho La Brea.

Over the following decades, the County Museum constructed new wings to house the expanded collections. Owned by the County of Los Angeles and operated by a separate board, the Los Angeles County Museum of History, Science, and Art was unique compared to other museums of the day in that it was a fundamentally a public institution, as opposed to other museums that would be reliant on private collections and endowments. Still, the county museum was sponsored by a network of organizations and donors who built the collection and supplemented the support provided by the County.[25]

Figure 17. Original 1913 building of the Los Angeles County Museum of History, Science, and Art in Exposition Park, ca. 1930 (left); Los Angeles County Museum of History, Science, and Art, with expansion under construction, ca. 1925 (right)

Source: Los Angeles Public Library

As Los Angeles continued to grow, wealth, and cultural prominence during the 1910s and 1920s, new museums were established. One of the premier institutes established during this period included the Huntington Library, Museum, and Gardens (the Huntington). Founded in 1919, the Huntington was located in San Marino on the grand estate of Henry E. Huntington, one of Los Angeles' most wealthy entrepreneurs. Huntington had amassed an impressive collection of art, decorative arts, books, and manuscripts, in addition to developing an elaborate series of gardens with an impressive horticultural collection.[26] In 1920, the Huntington opened the library component on the estate after completing a new building known as the Main Exhibit Hall. In 1928, a year after Huntington's death, the residence at the estate was converted into the Huntington Art Gallery. This coincided with opening the gardens to visitors, who could wander the grounds and thematic enclaves representing different gardening traditions and the collection of rare and exotic plants. Since its founding, the Huntington has continued to develop its collections and serve as one of the primary cultural institutions in the Los Angeles area.[27]

The Pasadena Institute of Art, now known as the Norton Simon Museum, was founded in 1924 as a wealthy social club that promoted nineteenth century European and American art. Originally located in the grand Reed Mansion in a wealthy enclave of Pasadena, the Pasadena Institute of Art would sporadically grow its collection as various wealthy benefactors bequeathed their collections to the

[25] Reiner, B. 1974. *National Register of Historic Places Inventory-Nomination Form – Natural History Museum of Los Angeles County*, p. 5. National Park Service. April.

[26] GPA Consulting, 2017, p. 52.

[27] GPA Consulting, 2017, pp. 52–53.

museum. It relocated in 1940 to a new space and was eventually rebranded as the Pasadena Art Museum.[28]

A departure from the promotion of fine arts during the first half of the twentieth century in Los Angeles was the creation of the Griffith Observatory. Fascinated with astronomy, Griffith J. Griffith created a fund to establish an observatory, planetarium, and museum as a public institution within the donated lands of Griffith Park. The fund was granted to the City of Los Angeles in 1919 after his death. While construction would take over a decade to occur, the City of Los Angeles partnered with the Works Progress Administration (WPA) to construct the iconic Art Deco style building set prominently on Mount Hollywood in Griffith Park. The facility was completed in 1935 and has continued to promote the study of astronomy ever since.[29]

POSTWAR EXPANSION OF CULTURAL INSTITUTIONS AND MUSEUMS (1945- PRESENT)

The post-World War II period in Los Angeles was defined by monumental growth in terms of population and wealth. The expansion of the aerospace, entertainment, real estate development, tourism, and a variety of other industries led to a vast expansion of cultural institutions throughout the region. One of the first was the California Museum of Science and Industry, which was founded in 1951 in the former State Exhibition Building in Exposition Park. Through extensive donations by Howard F. Ahmanson, a wealthy philanthropist involved multiple museums, the California Museum of Science and Industry would serve as the primary science center for Los Angeles, ultimately evolving into the California Aerospace Museum in 1984 and the California Science Center starting in 1996.[30]

One of the largest museum expansions of the postwar period was the construction of the Los Angeles County Museum of Art (LACMA). By the 1950s, the Los Angeles County Museum of History, Science, and Art was actively pursuing expanded art gallery facilities for its growing collection. The county museum initially hoped to expand its existing presence in Exposition Park, but shifted its focus to the County-owned Hancock Park, directly west adjacent to the La Brea Tar Pits. While the proposal was controversial, the plans moved forward with the support of extensive donations made by wealthy patrons.

Instantly one of the premier institutions in Los Angeles and the western United States, LACMA has continued to grow and expand with the support of an extensive network of donors and benefactors, in addition to continued support from the County of Los Angeles.[31] This coincided with the expansion of other cultural institutions, most notably the Los Angeles Music Center in downtown Los Angeles, which includes the Dorothy Chandler Pavilion, Ahmanson Theater, and Mark Taper Forum, all of which were completed between 1964 and 1967.[32] Similar to LACMA, these civic institutions came to fruition through the support of a network of wealthy donors interested in establishing a premier performing arts center for the City. Indeed, the development of LACMA and the Los Angeles Music Center would solidify Los Angeles' reputation as a cultural center of national significance.[33]

Other institutions expanded and founded in the postwar period include the Pasadena Museum of Art, which was greatly expanded between 1974 to 1975 with a new facility to accommodate the fine art

[28] GPA Consulting, 2017, p. 51.

[29] Harnisch, 2013.

[30] Allgov.com. n.d.. California Science Center. Available at: http://www.allgov.com/usa/ca/departments/business-consumer-services-and-housing-agency/california_science_center?agencyid=175#historycont. Accessed July 28, 2022.

[31] GPA Consulting, 2017, pp. 46–47.

[32] GPA Consulting, 2017, p. 49.

[33] GPA Consulting, 2017.

collection of benefactor Norton Simon; the museum was renamed in his honor and continues to operate as the Norton Simon Museum.[34]

One highly influential art collector and patron of the arts in Los Angeles was J. Paul Getty, a businessman who made his fortune in the oil industry. Beginning in 1948, Getty gifted a number of pieces from his collection to the Los Angeles County Museum of Art. In the 1950s, Getty took "greater and greater steps to make art available for the public's education and enjoyment," first by establishing the J. Paul Getty Museum Trust in 1953, then by opening the J. Paul Getty Museum in 1954, in his ranch house in present-day Pacific Palisades.[35] Expanding on this foundation, in 1974 Getty's established the Getty Villa, a reconstruction of a Roman villa that showcased Getty's collection of antiquities and fine arts. The Getty Foundation would eventually outgrow this facility, constructing the now-iconic Getty Center complex overlooking Sepulveda Pass between 1984 and 1997.[36]

In 1975, Los Angeles-based businessman and philanthropist George C. Page donated millions to the County of Los Angeles for the construction of a museum at the La Brea Tar Pits. While plans for a museum at the property had been in various stages of planning since the 1920s, plans failed to materialize until Page became involved in the process. Although administered by the Museum of Natural History of Los Angeles, Page secured an influential role in the project through his donation, selecting the design team and working throughout the entirety of the planning and construction process. The resulting George C. Page Museum, sited east of the tar pits in Hancock Park, opened in 1977 with the focus on the prehistoric finds of the La Brea Tar Pits.[37]

Other museums founded during the second-half of the twentieth century covered a wide range of subject matter and collections, although almost all were developed through the donations of wealthy patrons. The museums of Los Angeles were located throughout the expanse of the city and surrounding region, but were typically clustered in particular areas, such as downtown, the Miracle Mile neighborhood along Wilshire Boulevard (referred to as "Museum Row" for its growing collection of museums), and the Westside and Sepulveda area. Through the second half of the twentieth century, prominent additions to Museum Row on Wilshire Boulevard have included the Academy Museum of Motion Pictures, in the former May Company building at 6065 Wilshire Boulevard, and the Peterson Automotive Museum, at 6060 Wilshire Boulevard.

Opened in 2021, the Academy Museum of Motion Pictures was originally designed by A.C. Martin and Associates as a department store for the May Company; the distinctive Streamline Moderne-style building was constructed in 1939. In the early 1990s, the department store closed, and the building was sold to LACMA in 1994, reopening as LACMA West in 1999. In 2014, the building was leased to the Academy of Motion Picture Arts and Sciences for use as the Academy Museum of Motion Pictures. The former May Company building was rehabilitated and expanded, with a distinctive, spherical addition and connector designed by Renzo Piano.

The Peterson Automotive Museum was originally designed by Welton Becket and Associates as Seibu of Los Angeles, "the U.S.'s first big Japanese-owned department store," which operated at the location from 1962 through 1965 when the store closed.[38] After a stint as the site of Orbachs department store until 1986, the building was remodeled in 1994 by the Russell Group (Marc Whipple, AIA) for use as the Petersen Automotive Museum. In 2014, Kohn, Pedersen and Fox (KPF Architects) remodeled the

[34] GPA Consulting, 2017, pp. 51–52.

[35] The Getty. n.d. Getty History, About the Getty. Available at: https://www.getty.edu/about/whoweare/history.html. Accessed August 5, 2022.

[36] The Getty, n.d., p. 53.

[37] Biederman, P.W. 1990. "Founder Used Marketing Skill to Package Tar, Bones, Ancient History". *Los Angeles Times*, 29 July 1990. ProQuest Historical Newspapers.

[38] "Retailing: A Touch of Tokyo." March 23, 1962. Time Magazine. Available at: https://content.time.com/time/subscriber/article/0,33009,829151,00.html. Accessed December 21, 2022.

museum building to its current appearance. Along with LACMA and the La Brea Tar Pits, these institutions form the core of present-day Museum Row.

Los Angeles also features a wide variety of smaller museums, institutions, cultural centers, and historic sites that cover a wide range of historic, artistic, and socio-cultural themes, ranging from specific community and ethnic histories to more popular culture, ephemera, and avant-garde collections. A majority of these smaller institutions, of which there are dozens throughout the region, are predominantly operated by non-profit organizations, but can include a variety of public and private partnerships as part of their operations.

Development of Public Parks in Los Angeles

EARLY PLAZAS, PARKS, AND PLEASURE GROUNDS (1781-1903)

Public park spaces have been an integral component of Los Angeles since its initial founding as a Spanish settlement. In accordance with Spanish Colonial town planning traditions and guidelines – outlined in *Ordenanzas de Descubrimiento, Nueva Población y Pacificación de las Indias,* commonly referred to as the "Law of the Indies" – newly established townsites were to be organized around central plazas. While the Los Angeles Plaza changed location, size, and configuration in response to flooding events, the concept of a central plaza was consistent throughout the City's Spanish and Mexican eras.

By 1815, the Los Angeles Plaza was established in its current location and was primarily defined by an expanse of open space with a square configuration formed by the adjacent gridded street network, Plaza Church, and a series of low-profile adobe buildings. It remained in this condition following the 1840s annexation of California by the United States until 1859, when the plaza was redeveloped as a semi-public park space with a central water storage building (Figure 18). The plaza was made fully public again in 1870 and re-landscaped in the simple iteration of the nineteenth century Anglo-American tradition with a central fountain, circular walking paths, and decorative wrought-iron fence.[39] A similar early park was the Lower Plaza, now known as Pershing Square. Founded on undeveloped lands from the original Pueblo settlement, the Los Angeles Plaza was declared a municipal park in 1866. It remained largely undeveloped for several years, but a series of plantings and other improvements happened organically until an official landscape plan was developed in the 1880s.[40]

[39] Prosser, D. 2017. *SurveyLA: Los Angeles Historic Resource Survey – Los Angeles Citywide Historic Context Statement, Public and Private Institutional Development/ Government Infrastructure and Services/ Municipal Parks, Recreation, and Leisure, 1886-1978,* p. 5-7. Prepared for the City of Los Angeles, Department of City Planning, Office of Historic Resources.

[40] Los Angeles Conservancy. 2020. Pershing Square. Available at https://www.laconservancy.org/locations/pershing-square. Accessed August 16, 2022.

Figure 18. Los Angeles La Plaza, ca.1857

Source: Los Angeles Public Library

By the late nineteenth century, the concepts of the "pleasure ground" and "wilderness parks" became the model for the development of public parks in Los Angeles. Characterized by their romantic and idyllic picturesque qualities, the pleasure ground and wilderness parks were born out of the American Transcendentalist movement of the late nineteenth century, which promoted natural and open spaces as a regenerative experience in contrast to the conditions within industrialized urban centers of the period.[41] Although intended to be natural settings, pleasure-ground parks were carefully designed and maintained to create the illusion of a natural, organic setting, whereas the wilderness park model would retain large areas of land as is, with some landscaped elements along the periphery and at select locations.

In Los Angeles, these park types also had a practical role in redeveloping land that had no profitable use or was perceived as undevelopable, either through uneven terrain, poor drainage, or other site conditions that impeded construction. The land for these early pleasure grounds and wilderness parks was often either donated to Los Angeles for development and public use, or was developed as a promotional tool for selling adjacent real estate and eventually transferred to the City.[42]

The first park developed during the late nineteenth century in Los Angles, beyond the two plaza parks, was Elysian Park. Included within the original pueblo lands and located northwest of the city's core, Elysian Park was founded in the wilderness park model with over 500 hundred acres of land with steep hills forming the parklands. Elysian Park was officially established in 1886.[43] The second park was Westlake Park, now known as MacArthur Park. Centered within the residential neighborhood and early streetcar suburb of Westlake, located west of the central business core, the land of Westlake Park was characterized by swamp-like conditions. Seen as a detriment to both residents and real-estate interests, the land of Westlake Park was redeveloped as a pleasure-ground park through a public-private partnership between the City and a group of citizens. As with many pleasure grounds, Westlake Park's wetlands were redeveloped into a lake as a central water feature, whereas the surrounding spaces were redeveloped with rolling hills and various plantings for garden strolls and picnicking. A boat house, consistent with the Victorian tradition, was also constructed along the lake.[44]

[41] Prosser, 2017, pp. 7-8.

[42] Prosser, 2017, pp. 7-8.

[43] Prosser, 2017, p. 8.

[44] Prosser, 2017, pp. 7-9.

In 1889, Eastlake Park was created in the now-known neighborhood of Lincoln Heights on land donated to the City by the Southern Pacific Railroad. Similar to Westlake Park, Eastlake Park was centered around a water feature of two lakes. Associated in part with the original zanjas water conveyance system of Spanish and Mexican-era Los Angeles, the two lakes served as storage reservoirs in addition to providing scenic and recreational value within the park. The park became one of the most popular destinations in Los Angeles, known for its idyllic scenery and notable attractions, which would eventually include rides and other carnival like amenities.[45]

In 1889, the City of Los Angeles created the Department of Parks to design and manage the growing numbers of parks. Administered by the Parks Commission, the Department of Parks would come to internally design, relandscape, and manage twelve parks by 1903. In addition to the original plazas and the two pleasure ground parks of Westlake and Eastlake, the Department of Parks acquired, designed, and developed Echo Park (established 1891), Hollenbeck Park (established 1892), and Sunset Park (established 1895, now known as Lafayette Park), as well as smaller park spaces such as Prospect Park, St. James Place, South Park.[46] By far the largest park in Los Angeles was that of Griffith Park. Named after Griffith J. Griffith – a wealthy mining magnate, industrialist, and an infamous character in Los Angeles during the late nineteenth and early twentieth century – the park was founded on several thousand acres of the former Rancho Los Feliz that Griffith ultimately donated to the City of Los Angeles for use as a public park in 1896.[47] Due to its vast size and mountainous topography, Griffith Park was retained in the wilderness park tradition by retaining much of the existing landscape with limited improvements through new circulation patterns and development along the more accessible peripheries.[48]

The most notable outlier from City of Los Angeles-owned parks during this period was Exposition Park. Located south of the central core of Los Angeles and established in 1872, Exposition Park, known at the time as Agricultural Park, was used as an agricultural fairground, complete with a horse racing track. Having earned a reputation for vice and being seen as a nuisance, the 160-acre parcel containing Agricultural Park was purchased by the State of California in 1880 to reuse the land as an agricultural exhibition space and use as a pleasure ground.[49]

DEVELOPMENT OF MUNICIPAL PARKS (1904-1941)

During the early twentieth century, the public park evolved from the pleasure ground and wilderness park models to a more modern iteration of the municipal park. In addition to planned and manicured open spaces – expressed in a mixture of picturesque and formal compositions – municipal parks began featuring a series of amenities and facilities that catered to a variety of recreational uses, marking a shift from a "passive enjoyment of the landscape," to more developed activities and amenities.[50] Consistent with the Progressive-era reforms of the early twentieth century, the municipal park model would often feature various educational and cultural programs, as well as the promotion of the outdoors and sport, all through purpose-built buildings, structures, playing fields, and other facilities.[51]

Early examples of the municipal park model came through the re-imagining and partial redevelopment of the existing pleasure ground parks through the introduction of new amenities and facilities. This was evident with the creation of the Griffith Park Zoo and the greenhouses of the Eastlake Park Conservatory,

[45] Prosser, 2017, p. 9.

[46] Prosser, 2017, pp. 9-11.

[47] Harnisch, L. 2013. "A Cosmic Gift to L.A." *Los Angeles Times*, February 26, 2013. ProQuest Historical Newspapers.

[48] Prosser, 2017, p. 10.

[49] Prosser, 2017, p. 11.

[50] Prosser, 2017, p. 11.

[51] Prosser, 2017, p. 11.

both in their namesake parks as well as a series of golf courses, horseshoe pits, and similar recreational elements.[52]

The first of the pleasure ground parks to be remodeled in the municipal park tradition was Eastlake Park. During the early twentieth century, Eastlake Park evolved from its original picturesque composition with the removal of insular roads for pleasure drives, ornamental bridges, and the expansion of picnic grounds and other open spaces for activities. While Eastlake Park did have a small zoo for a period of time, this too was removed and the area was redeveloped for park activities, transitioning the animals to a new zoo space at Griffith Park, which was designed and constructed in the Rustic tradition.[53]

Elysian Park was also transitioned from pure wilderness park to include more municipal park elements. Although the park was still in part celebrated for its wild and outwardly appearing natural qualities, new hiking trails, roadways, picnic areas, and camping facilities were developed to promote outdoor recreation in proximity to the growing communities in the Los Angeles area.[54] Similarly, Griffith Park saw the slow introduction of new elements and amenities, particularly along the more gentle slopes on the eastern side of the parklands. In addition to the Griffith Park Zoo that was constructed between 1912 to 1913, Griffith Park saw the construction of a municipal golf courses in 1914, 1923, and the 1930s; development of tennis courts, hiking trails, new picnic grounds, children's camps, and playgrounds; and construction of the Greek Theatre perming arts venue and the Griffith Observatory, both of which opened to the public in the 1930s.[55] While Griffith Park would come to boast many of the early recreational amenities and publicly facing cultural institutions, it retained much of its mountainous and undeveloped lands, which promoted outdoor recreation.

The state-owned Exposition Park was also redeveloped during this period to include cultural institutions, such as the Los Angeles County Museum of History, Science, and Art. The park was also re-landscaped in the City Beautiful tradition, which included more formal garden spaces with axial pathways throughout a series of sunken gardens, rose gardens, and prominent water fountains and other features. Many other smaller parks were also re-landscaped in accordance with the City Beautiful tradition, including the original plaza space of 6th Street Park, which was renamed Central Park following its remodel in 1910.[56]

As other communities throughout Los Angeles County grew alongside the namesake city, they too established a series of municipal parks. In 1902, the City of Pasadena constructed two new parks, the Central and Memorial parks, both of which were developed in the City Beautiful tradition. While Pasadena had garden spaces open to the public, such as the Busch Gardens, these were primarily private estates. The momentum for public parks increased during the early twentieth century and quickly expanded to include several parks during the 1910s and 1920s, including Brookside Park, which utilized extensive acreage in the Arroyo Seco for a variety of recreational purposes with a community center, golf course, swimming pool, walking trails, the Rose Bowl stadium, and other facilities that marked the shift towards increased recreation as a primary function of public parks.[57]

In addition to the re-imagining of the existing park spaces, there was an increased emphasis on the creation of smaller neighborhood parks and recreation centers during this period. The City of Los Angeles' Department of Playgrounds and Recreation was created in the 1920s, which reflected the increased mission of expanding both adult and children's recreational opportunities throughout Los Angeles. This resulted in a variety of new playgrounds; recreational club houses, bath houses, and public

[52] Prosser, 2017, p. 11.

[53] Prosser, 2017, pp. 12-13.

[54] Prosser, 2017, pp. 13-14.

[55] Prosser, 2017, pp. 15-17.

[56] Prosser, 2017, p. 6.

[57] Sapphos Environmental, Inc. 2012. *National Register of Historic Places Registration Form – Historic Designed Gardens in Pasadena, 1873-1975*, pp. E.39–E41. National Park Service.

swimming pools; and the promotion of public beaches throughout the region.[58] While some of these elements were introduced into existing parks, such as the recreational clubhouse at Echo Park, many were developed in new park spaces throughout the city. The collection of these recreational amenities within small municipal parks gave rise to the recreation center model, which included facilities that catered to variety of recreational pursuits.[59]

The development of these recreational facilities and other park improvements continued during the 1930s, despite the challenging economic conditions of the Great Depression. This was due largely to the Roosevelt Administration's New Deal policies and the creation of the WPA and similar programs that were tasked with employing citizens to construct new public amenities, including park landscapes and facilities. While the WPA was involved with countless park improvement projects throughout the Los Angeles region, one of the most notable developments was the construction of the Rancho Cienega Playground, now the Rancho Cienega Sports Park, as one of the largest municipal recreational facilities. Amenities included a running track, athletic fields and courts, public sports stadium, and a variety of other buildings, structures, and site improvements that catered to the emphasis on recreation and sport as essential public services.[60] The WPA was involved in other Los Angeles County communities as well, resulting in numerous recreational facilities, such as the Santa Anita Regional Recreational Center in Arcadia, Franklin Delano Roosevelt Park in Florence, Charles Farnsworth Park in Altadena, Belvedere Community Regional Park in East Los Angeles, and extensive upgrades to Brookside Park in Pasadena, among others.[61] The emphasis on sport was reflected in other parks as well, both on a smaller and significantly larger scale. This is particularly evident at the state-owned Exposition Park, where the Los Angeles Memorial Coliseum and Olympic Swim Stadium were constructed for the 1934 Olympic Games in Los Angeles.[62]

POSTWAR PARKS IN LOS ANGELES (1945–PRESENT)

The postwar period in Los Angeles saw exponential population growth and the proliferation of suburban residential neighborhoods. With the decentralization of sprawling new neighborhoods that extended throughout the region, new community parks and recreational centers were seen as fundamental components of these developments. In just the City of Los Angeles, plans for thirty new neighborhood recreation centers and thirteen regional sports centers were developed by the late 1940s. The neighborhood recreation centers were typically three to seven acres, would feature a recreation center or clubhouse, and would be surrounded by park land with picnic spaces, playgrounds, open space, and occasionally a playing field. The larger regional recreation centers would cover 10 to 20 acres and feature expanded recreational facilities, including public swimming pools, athletic fields, gymnasiums, and other recreation buildings that could serve multiple purposes.[63] All facilities would also include parking lots, consistent with the suburban environment and the inherent dependence on cars as the primary mode of transportation. The recreation center would be the standard model for park development during the 1950s and 1960s in communities throughout Los Angeles County, California, and the broader United States.

[58] Prosser, 2017, p. 22.

[59] Prosser, 2017, pp. 22-25.

[60] Prosser, 2017, pp. 28-29.

[61] Architectural Resources Group, Inc. 2016. *City of Arcadia Citywide Historic Context Statement*, p. 4. Prepared for the City of Arcadia Development Services, Planning Division; The Living New Deal, 2014. "Franklin Delano Roosevelt Park." Available at: https://livingnewdeal.org/projects/franklin-delano-roosevelt-park-los-angeles-ca/, accessed August 17, 2022; The Living New Deal, 2014. "Charles S. Farnsworth Park," Available at https://livingnewdeal.org/projects/charles-s-farnsworth-park-altadena-ca/. Accessed August 17, 2022; The Living New Deal, 2014. "Belvedere Community Regional Park." Available at: https://livingnewdeal.org/projects/belvedere-community-regional-park-los-angeles-ca/. Accessed August 17, 2022; The Living New Deal, 2016. "Brookside Park Improvements." Available at: https://livingnewdeal.org/projects/brookside-park-improvements-pasadena-ca/. Accessed August 17, 2022.

[62] State of California, Exposition Park. n.d. Park History. Available at: http://expositionpark.ca.gov/about-us/park-history/. Accessed August 18, 2022.

[63] Prosser, 2017, pp. 29-30.

While postwar parks utilized the modernist architectural vocabulary and focused on a variety of recreational amenities and sports facilities, later postwar parks in Los Angeles would revert to a more picturesque and natural aesthetic. This was reflected in new regional parks, which retained a combination of recreational facilities and amenities, as well as more naturally apparent landscapes as part of the promotion of outdoor education and a more tranquil experience, marking a return to a more wilderness park and pleasure ground-based ethos within the context of the emerging environmental conservation concerns.[64] This was evident at larger park developments in communities within the San Fernando Valley and other suburban areas where more rugged land was still accessible, such as Chatsworth Park and a series of interconnected parks set within the canyons of the Porter Ranch development.[65] The County of Los Angeles Department of Parks and Recreation was also instrumental in promoting the new emphasis on natural landscapes and conservation by overseeing a variety of regional natural areas, wildlife sanctuaries, historical and cultural sites, in addition to the various arboreta, botanical gardens, lakes, and other parks under their purview.[66]

During the 1970s and 1980s, some parks in Los Angeles, particularly those in core urban areas, entered into a state of perceived decline. Driven in part by increased suburbanization and the middle-class's focus on the private residential backyard, many public parks became underutilized and associated with increased vandalism, violence, and criminal activity. Increased maintenance and security costs coupled with budget cuts perpetuated this decline of parks in Los Angeles during this period. However, despite these challenges, as well as new challenges such as increased homelessness, various parks and recreation agencies throughout Los Angeles County have continued to develop, rehabilitate, and market park properties for the public's use and accommodate shifting trends in recreation.[67]

History and Context of the Project Site

Rancho La Brea, Early Settlement

The project site and the surrounding area was initially inhabited by Native Americans who the Spanish called Gabrielino, and who today call themselves Gabrieleño, Tongva, and Kizh. They maintained a network of villages throughout the Los Angeles River basin, including a village near the tar pits. The tar pits were an uncommon and valuable resource, providing the bituminous coating that could be used for creating impermeable barriers for canoes and water carrying vessels.[68] The first Europeans to document the La Brea tar pits were part of the Spanish expedition under Gaspar de Portolà, who came across them in 1769 while enroute from San Diego to San Francisco. With the founding of Spanish settlements in the region, particularly the Pueblo de Los Angeles, the tar pits continued to be an important resource for the growing community as a construction material, particularly as a roof sealant. Roadways were established along the former Native American trails, connecting the tar pits with the pueblo. The most prominent of these was El Camino Viejo, which was frequented by ox-driven wagons carrying the bituminous material, referred to as *brea*, from the tar pits to the pueblo for building applications.[69]

Following Mexican Independence, the area around the tar pits was provisionally granted in 1828 as Rancho La Brea to Antonio Jose Rocha, a Portuguese immigrant who was a blacksmith and prominent settler in Pueblo de Los Angeles. The land grant, which covered portions of present-day Mid-Wilshire,

[64] Prosser, 2017, p. 38.

[65] Prosser, 2017, pp. 38-39.

[66] County of Los Angeles Department of Parks and Recreation. 2022. Park History. Available at: https://parks.lacounty.gov/about-us/. Accessed August 17, 2022.

[67] Prosser, 2017, pp. 43-44.

[68] Architectural Resources Group, Inc. 2015. *SurveyLA: Historic Resources Survey Report, Wilshire Community Plan Area*, p. 10. Prepared for City of Los Angeles Department of City Planning, Office of Historic Resources.

[69] McCawley, William, 1996. *The First Angelinos: The Gabrielino Indians of Los Angeles*. Mali-Ballena Press, Banning, California.

Hollywood, and West Hollywood, was specifically given with the condition that the public could continue to travel to the tar pits to extract the brea material as needed. While Rocha and his family established an adobe ranch house on the rancho, portions of the 4,400-acre property were sold off over the following years.[70]

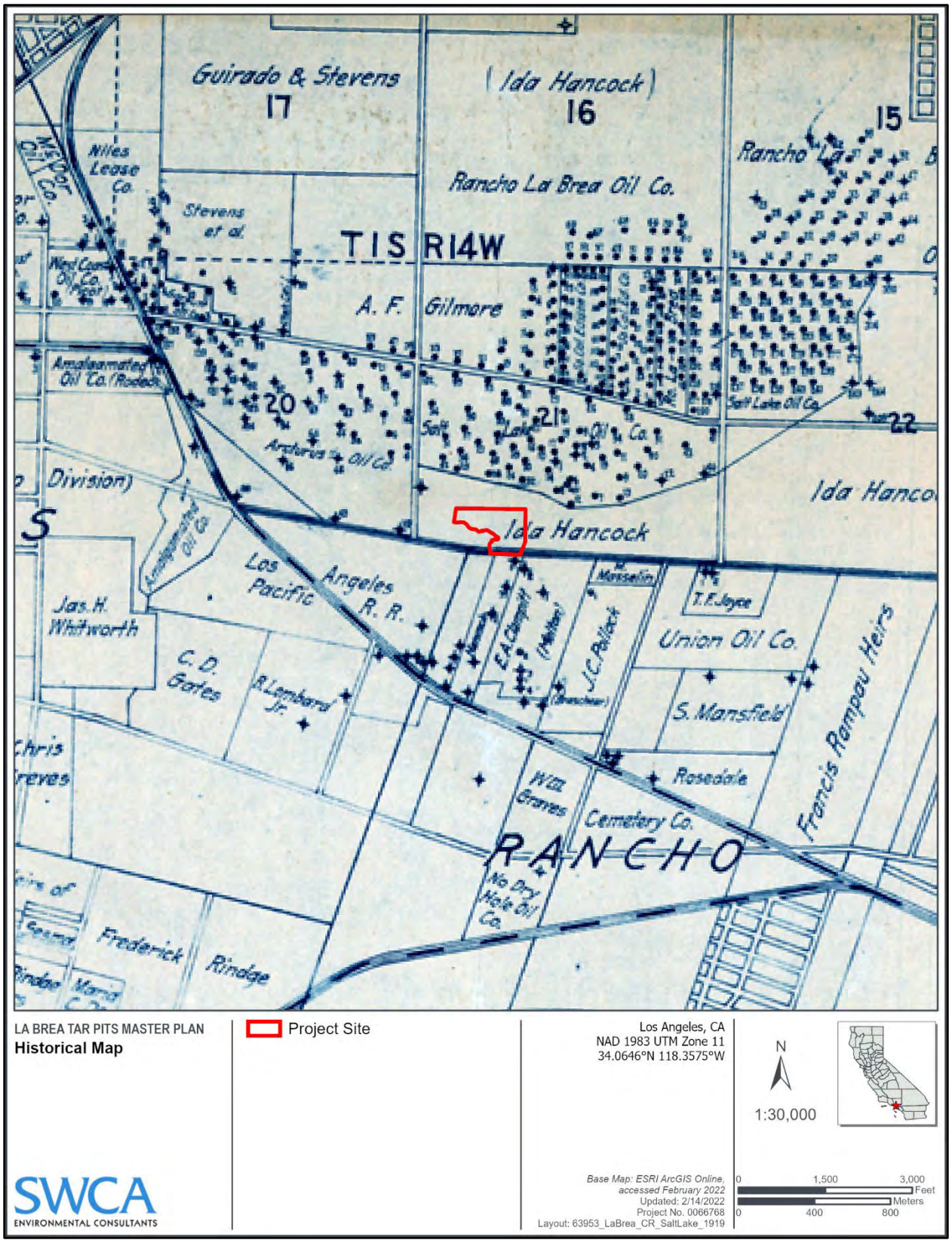
In 1849, Major Henry Hancock came to California as part of the California Gold Rush, initially settling in San Francisco before relocating south to Los Angeles. Through his work as a surveyor, Major Hancock was responsible for surveying the former land grants, often on the behalf of the original grantees as part of the lengthy legal battles regarding ownership following the annexation of California by the United States. Hancock worked on behalf of the Rocha family in their claim to the Rancho La Brea lands, and ultimately purchased the property when the Rochas were unable to pay the extensive legal expenses incurred during the drawn-out process.[71] Major Hancock and his wife Ida primarily used the ranch for raising livestock, but also excavated asphaltum and shipped the materials from the tar pits throughout California. The excavations on the property ultimately filled with water to create the large asphaltum lakes that famously characterized the property over the following decades.

Rancho La Brea was one of several properties owned by Major and Ida Hancock throughout California (Figure 19). With multiple political and commercial pursuits throughout the state, the Hancocks were prominent in San Francisco, Sacramento, as well as Los Angeles.

[70] Seaman, F.J. 1914. A brief history of Rancho La Brea. In *Annual Publication of the Historical Society of Southern California* 9(3):253–254.

[71] Architectural Resources Group, 2015, p. 10.

Figure 19. The large-scale holdings of Ida Hancock in the vicinity of the project site, 1919, with dots indicating location of oil wells



Following Major Hancock's death in 1883, his wife, Ida Hancock relocated with their three children to the rancho, where they continued with livestock ranching.[72] From their ranch home on the banks of one of the oil lakes, the Hancocks led a relatively modest life during this period. However, by the end of the nineteenth century, oil exploration was becoming commonplace in the Los Angeles basin, and exploration of the Rancho La Brea lands was of particular interest to early oil prospectors.

In the early 1900s, Ida Hancock leased a portion of Rancho La Brea to the Salt Lake Oil Company, which quickly struck oil and spurred a significant boom in well development and oil production. Ida Hancock, along with her son George Allen Hancock, founded the Rancho La Brea Oil Company, which began developing wells and producing oil on the unleased portions of their property.[73]

In a short period, the Rancho La Brea lands surrounding the ranch house and tar pits would become a vast oil field, characterized by a landscape of derricks (Figure 20), and the Hancocks would be considered one of the wealthiest families in California.[74]

Figure 20. Colorized photograph of Rancho La Brea with the Hancock ranch complex at center and oil field in the background, ca. 1910

Source: California State Library, California Revealed Digital Preservation Initiative

[72] Seaman, 1914, p. 254.

[73] Seaman, 1914, pp. 254–255.

[74] Seaman, 1914, p. 255.

FOSSIL EXCAVATIONS AT RANCHO LA BREA

While fossil excavations would not begin until the early 1900s, the existence of fossils in the La Brea Tar Pits had been observed as early as 1875, by Dr. William Denton in a paper presented to the Boston Society of Natural History.[75] Early twentieth-century oil exploration, however, brought to light the extent and significance of the site's paleontological resources. In light of the importance of the site and following its 1923 donation to the County of Los Angeles the long-term use and character of the large parcel now encompassing Hancock Park diverged significantly from the surrounding, densely developed neighborhood. In the early twentieth century, Rancho La Brea had already been recognized as home to one of the most important collections of late Pleistocene asphaltic fossils in the world.

During the era of oil exploration, between 1901 and 1902, geologist W.W. Orcutt visited Rancho La Brea to conduct studies on the feasibility of oil production for the Union Oil Company. As part of these investigations, Orcutt discovered fossils of prehistoric animals, including teeth from saber-toothed cats.[76]

Based on this discovery, in 1906, paleontologist Dr. John C. Merriam from University of California, Berkeley, was granted access to conduct a dig on the property, forming the first official and scientific paleontological excavation of the property. Along with a group of students, Dr. Merriam and his team began to dig out and recover fossils, procuring them for exhibition at the university.

News of the dig spurred interest from other institutions, including Occidental College, University of California, Los Angeles, Los Angeles Museum (now the Natural History Museum of Los Angeles County), the Southern California Academy of Sciences, and even Los Angeles High School, all of which conducted digs and secured enough material to reconstruct their own skeletons (Figure 21).[77]

Figure 21. Excavations of fossils at Rancho La Brea with oil derricks in the background, 1911 (left); workers cleaning extracted fossils, ca. 1915 (right)

Source: Los Angeles Public Library

[75] Kegley, H. 1940. "Something Bigger Than Barnum: A Monument to Monsters." Los Angeles Times, 10 March 1940. ProQuest Historical Newspapers. Available at: https://www.proquest.com/latimes/index.

[76] Seaman, 1914, p. 255.

[77] Bartlett, D.W., 1927. "Progress Made in Developing Tomb of Giants: Creation of New Park at La Brea Pits Gives City Unique Monument." *Los Angeles Times*, 27 March 1927. ProQuest Historical Newspapers; Kegley, H. 1940. "Something Bigger Than Barnum: A Monument to Monsters," *Los Angeles Times*, 10 March 1940, ProQuest Historical Newspapers. Available at: https://www.proquest.com/latimes/index.

As word spread of the concentration of fossils at Rancho La Brea and requests for concessions to excavate continued to pour in, the Hancock family reevaluated their approach and drastically reduced the number of institutions that would be allowed to dig on the property. Priority was granted (exclusively) to local institutions, primarily the Los Angeles County Museum of History, Science, and Art (the predecessor to the Natural History Museum) which was given a 2-year concession to excavate and uncover as many fossils as feasible. The concession featured a strict time limit, so the County provided the necessary grants to recover the maximum amount of material within the allotted period.

Led by museum directors Frank S. Daggett and William Alanson Bryan, alongside a team of ornithologists and paleontologists, a crew of a dozen worked steadily for the entire 2-year concession; the team's painstaking process, along with a preview of treasures unearthed, was described in a feature-length article in the 27 March 1927 issue of the *Los Angeles Times*.[78]

As described in the article, in terms of process, the team would locate a deposit of fossils, then start digging a long trench to cover the lateral extent of the deposit, before digging outwards in 3-foot transects. Bone locations were then removed for processing, cataloguing, and transfer to the museum's facility at Exposition Park. During the dig, the team excavated over 100 pits, of which 30 included noteworthy deposits. From these deposits, the team extracted hundreds of thousands of fossilized prehistoric animal bones, which were catalogued and transported to the museum. At the time, this find was considered the largest collection of Pleistocene fossils in the world, representing thousands of animals, including wolves, saber-toothed cats, giant sloths, short-nosed bears, birds, camels, bison, and the iconic mammoths and mastodons, among others.

While the fossils uncovered by the Los Angeles County Museum of History, Science, and Art dig were too plentiful for a single exhibition, the museum constructed a special exhibition space called "La Brea Hall," where some of the most iconic and complete skeletons were displayed. In addition to the exhibits in La Brea Hall, Hancock Park and the La Brea Tar Pits became an extremely popular tourist destination; by 1940, the park attracted an estimated 500 visitors each weekday, and 1,000 each Sunday.[79]

Newspaper coverage in the *Los Angeles Times* in 1940 presented an overview of the offerings of La Brea Hall; as shown in Figure 22 below; captions read "Dr. John A. Comstock, left, and Dr. William Bryan examine a reconstructed bear of the glacial period; the bones were found in the tar pits" (left image) and "This skeletal exhibit at the museum represents 25 years of work—digging, scraping, classifying and assembling" (right image).

[78] Bartlett, 1927.

[79] Kegley, 1940.

Figure 22. Exhibits at La Brea Hall, 1940

Source: Los Angeles Times, 10 March 1940

Hancock Park

The project site falls within the larger 23-acre Hancock Park, which has remained intact as a relatively undeveloped open space, public park, and cultural institution in the Mid-Wilshire neighborhood for nearly a century.[80] The complex is characterized by a mixture of recreational space, walkways, hardscaping, mature trees and landscaping, the La Brea Lake Pit, seeps, and excavation pits, and museums/exhibition spaces both on-site and in the surrounding vicinity. Established in the early 1920s, Hancock Park owes its tenure and significance to the naturally occurring tar pits and paleontological fossil deposits throughout and beneath its surface (described in the previous section).

FOUNDING YEARS

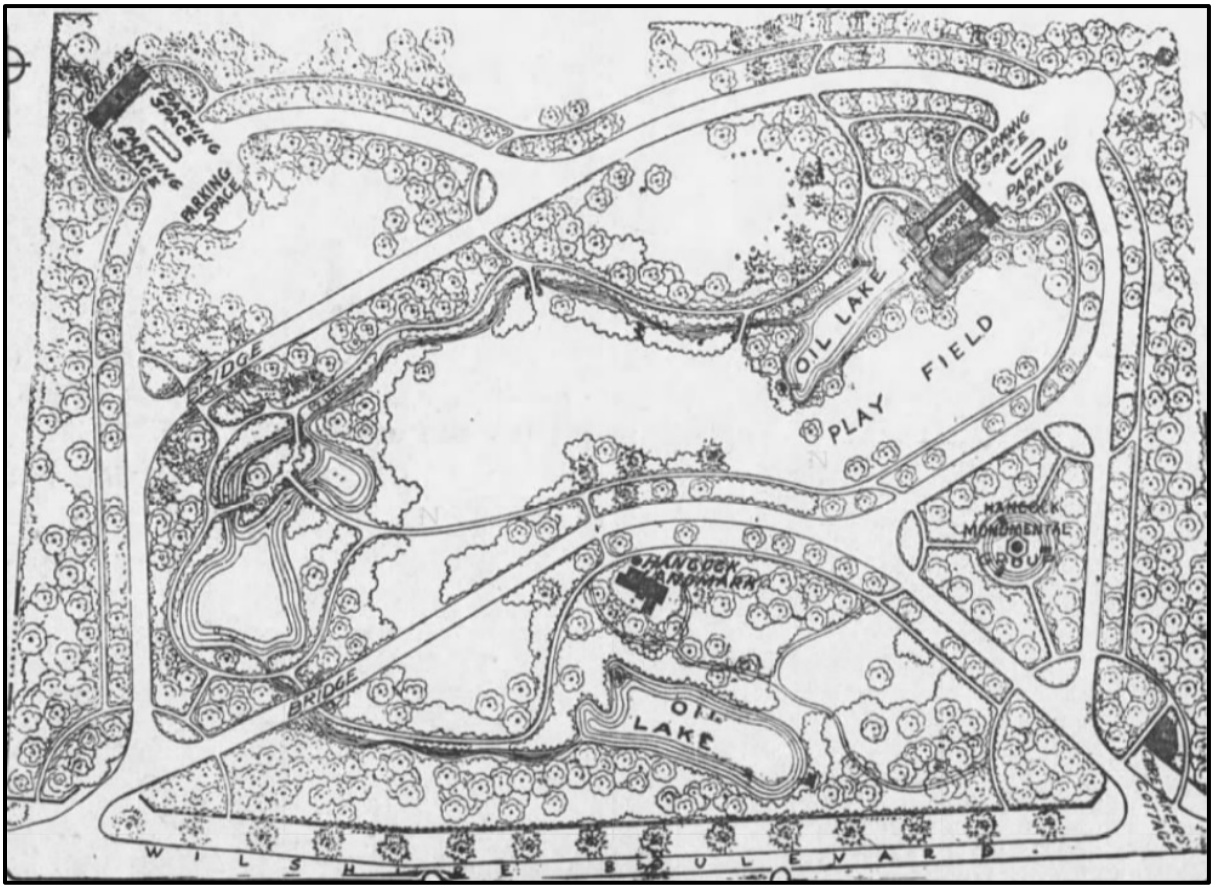
In 1915, in light of the site's scientific importance, G. Allan Hancock (son and heir of Henry and Ida Hancock) and the County of Los Angeles began discussing a potential donation of the tar pits and 32 acres of the adjacent property for a park and museum, which would preserve the space in perpetuity for scientific investigations and public enjoyment and education. Stipulations of the donation, as outlined by Hancock, included construction of a small museum for exhibiting fossils and sculpted recreations of the prehistoric mammals; landscape development with trees, ornamental shrubs, and fencing; parking and

[80] Not to be confused with the Los Angeles residential neighborhood of Hancock Park, which is located east of the project site.

circulation catering to automobiles; and the general condition prohibiting oil development on the property.[81] To solidify these stipulations and provide a robust vision for the park's development, Hancock commissioned landscape architect Paul G. Thiene to prepare a plan in 1916; Thiene worked in conjunction with his associate at the time, renowned architect Lloyd Wright.[82] Theine, a German-born landscape architect and horticulturalist, worked for a number of prominent horticulturalists and landscape designers in the early twentieth century. By 1910, Thiene was working with renowned landscape architects, Frederick Law Olmsted, Jr., and John Charles Olmsted. He assisted the Olmsted brothers with the San Diego Panama-California Exposition. Although the Olmsted brothers left the Balboa Park commission, Thiene continued to work on the project with Bertram Grosvenor Goodhue. Theine's contributions to Balboa Park attracted multiple high-profile commissions for private gardens throughout the southland.[83] This included G. Allen Hancock, who commissioned Thiene to prepare a preliminary plan for Hancock Park as part of the proposed donation.

An article in *The Los Angeles Times* outlined details of the plan developed by Thiene in partnership with Lloyd Wright, including a rendering of the site plan, which reflected a picturesque, and Olmstedian design (Figure 23). The Thiene and Wright plan was never realized, but the plans represent the first attempt to apply a unified master plan and design to the park and its cultural resources.

Figure 23. Site plan for Hancock Park, 1916, Paul G. Thiene and Frank Lloyd Wright, Jr.



Source: Los Angeles Times, 12 December 1916

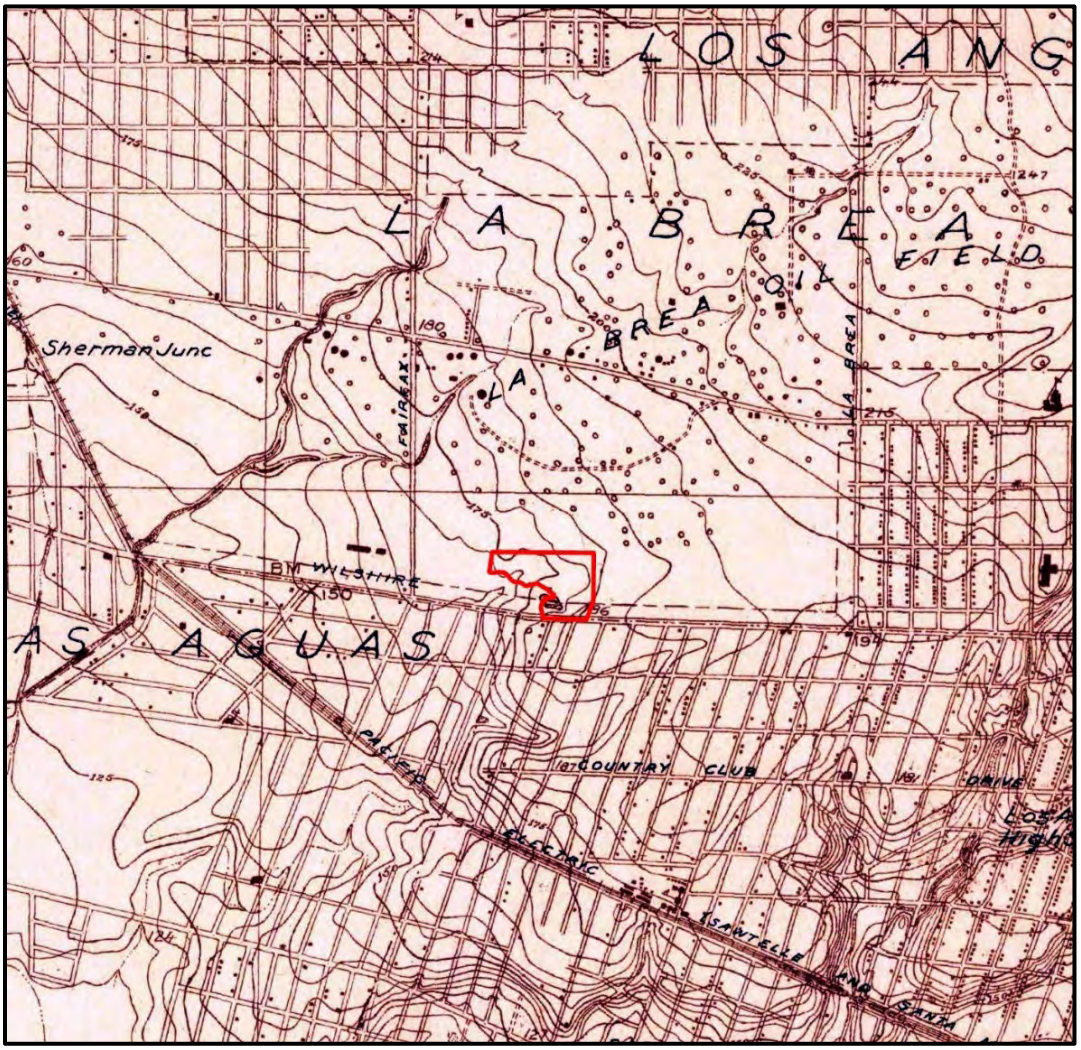
[81] "Unique Among World Parks," *The Los Angeles Times*, May 2, 1916.

[82] "Deed to Hancock Park is Given to County," *The Los Angeles Times*, December 12, 1916.

[83] Carter, N.C. 2022. Place Studies - Paul Thiene in Southern California. Library of American Landscape History. Available at: https://lalh.org/place-studies/paul-thiene-in-southern-california-2019/. Accessed April 27, 2022.

In subsequent years, Hancock and the County continued discussions on the terms for the donation of the property for use as a public park. By 1923, ongoing negotiations around the Hancock land gift were showing promise. The land gift was reduced to approximately 25 acres and included revised stipulations by Hancock, which required that the entirety of the land be used for public park purposes, the tar pits remain unchanged and open for visitors to observe, that work on the park must begin immediately, and that no fence more than 5 feet high would be erected closer than 30 feet from the street.[84] The terms were finalized in December 1923, and the land was officially transferred to the County in 1924 (Figure 24).[85] Reporting from the time suggests that no formal plans were submitted as part of the transfer, but Hancock's stated wish was that the property be developed as one of the City's finest urban parks. With no accompanying financial gift with the property, however, the County was responsible for funding improvements. In light of this, the County adopted a phased approach, beginning on limited projects while a unified, overall plan was developed.

Figure 24. Project site as of 1924, as surrounding areas were in the process of rapid subdivision and development; as of 2022, Hancock Park's oversized parcel remains one of the few in the area



Source: 1924 USGS Hollywood topographic map

[84] "Land Gift for County Park," *The Los Angeles Times,* November 27, 1923.

[85] "Hancock Park to County," *The Los Angeles Times,* December 12, 1923; "La Brea Tar Pits History," La Brea Tar Pits & Museum. Available at: https://tarpits.org. Accessed April 27, 2022.

PRE-WORLD WAR II EXPANSION (1926–1944)

As the donation of Hancock Park was finalized, during the Roaring 1920s, the park's surrounding vicinity was in the midst of a significant transformation. During Los Angeles's 1920s boom, this area (along with many others throughout Los Angeles and Southern California) shifted from expansive ranch lands and oil fields to a rapidly developing metropolis. During Hancock Park's first decade, the City experienced rapid urban development and exponential growth. Due to Hancock's gift, however, the large open space and cultural resources on the site of Hancock Park weathered the development pressure that was steadily transforming all surrounding areas of the neighborhood.

During this time, the original El Camino Viejo roadway, which connected the tar pits with the Pueblo de Los Angeles in the City's original downtown, was developed as Wilshire Boulevard. Wilshire continued along the original alignment along the southern boundary of the former Rancho La Brea land grant, extending west towards Santa Monica and the Pacific Ocean. With the growth and expansion of Los Angeles in the early 1920s, and the original downtown increasingly clogged with traffic congestion, the developer A. W. Ross sought to capitalize on this momentum; he saw Wilshire Boulevard as the perfect location for a new commercial district.[86]

With the completion of the Ambassador Hotel in 1921 (Wilshire Boulevard and Normandie Avenue) in 1921, along with the construction of high-end communities like Hancock Park and Beverly Hills, Ross realized that the City's westward expansion along Wilshire was inevitable. He sought to create a new, vibrant commercial corridor. Focusing on the segment between Highland and Fairfax avenues, Ross began to speculatively purchase the vacant lots that were subdivided from agricultural and oil field properties that defined the area. To many, the idea of the commercial district seemed fantastical, especially in an area defined by the tar pits, crowded oil fields, and open farmland.[87] Nevertheless, Ross continued to strategically purchase property for development along and adjacent to Wilshire Boulevard.

By the mid-1920s, limited development had occurred, and the moniker "Miracle Mile" had been created. By the 1930s, Wilshire Boulevard had become an established, highly sought-after commercial corridor with grand Art Deco and Moderne office buildings, department stores, theaters (and well-advertised parking lots, which provided a welcomed relief and draw for shoppers and visitors). The increasing urbanization of the area continued to encroach around Hancock Park throughout this period.

In 1926, during the initial phase of Ross's plans for the Miracle Mile, renewed plans for Hancock Park were announced by the County. New designs for "Pleistocene Park," as the Hancock Park property was referred to, featured notable similarities to the 1916 plans, with extensive plantings around the park perimeter, a central open lawn and recreational field, the preservation of the open tar pools and oil lakes, and the restoration of the original creek that extended diagonally through the site (Figure 25). However, the updated plan included some variations, including the omission of on-site parking and automobile circulation through the park, formal landscaping and collections of monuments, and plans for a pedestrian bridge extending from Wilshire Boulevard across the Lake Pit, leading directly into a new museum.[88] These changes reflected an updated vision of providing a space that looked and felt like a Pleistocene (rather than Beaux Arts classical) environment, by creating a semi-immersive parkland focusing on the paleontological significance of the site.

In addition to removing automobile circulation from the park, the key elements of this reimagining of the "dawn-era landscape" included restoring water features, a robust planting plan along the perimeter of the property, preserving open pits for interpretive and scenic purposes, and the adding statues of prehistoric

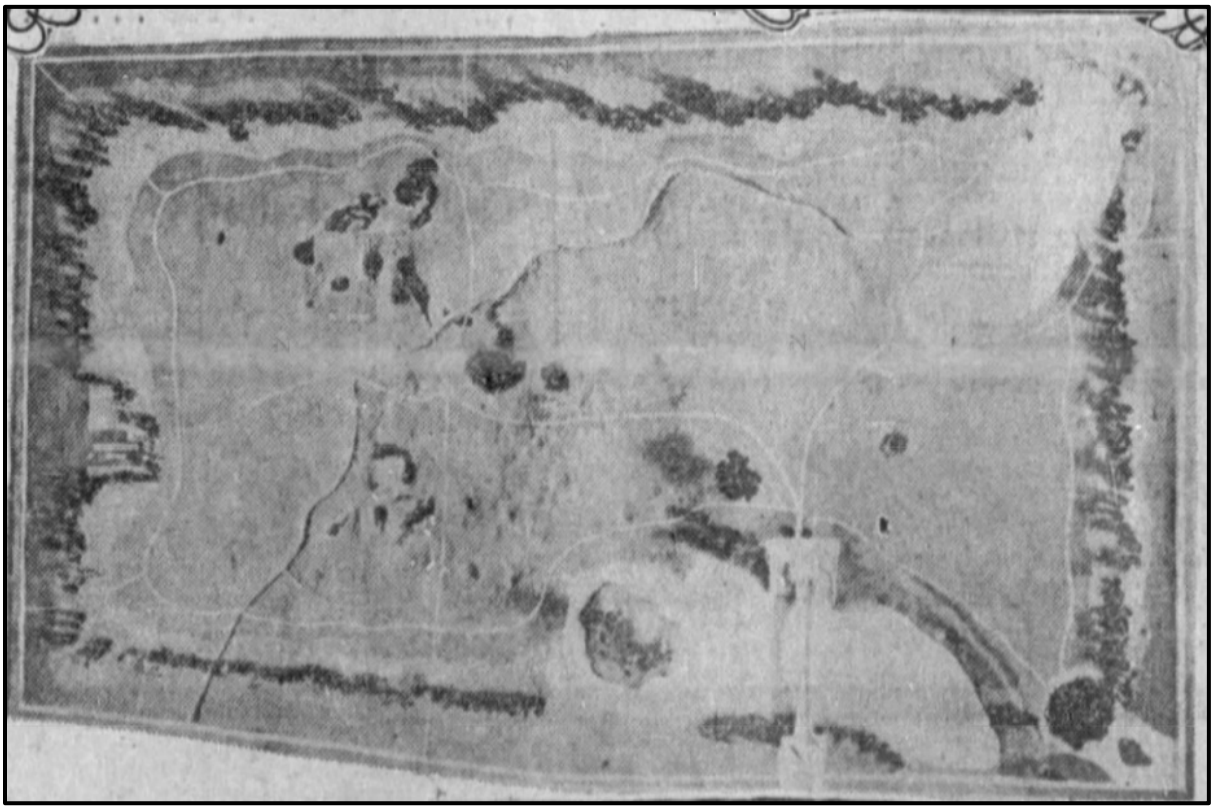
[86] GPA Consulting, 2017, p. 9.

[87] GPA Consulting, 2017, p. 9–10.

[88] Crane, C. "La Brea to Be Made Park," *Los Angeles Times*, November 7, 1926.

creatures throughout the meandering pathways.[89] The plans also called for separating the park from the surrounding, increasingly urban environment by a perimeter of trees, which would create a version of the Pleistocene environment and an immersive experience for visitors.

Figure 25. 1926 plan for Hancock Park (originally "Pleistocene Park"); note large Lake Pit in southeastern corner, with pedestrian bridge leading to museum, and open tar pits throughout



Source: Los Angeles Times, November 7, 1926

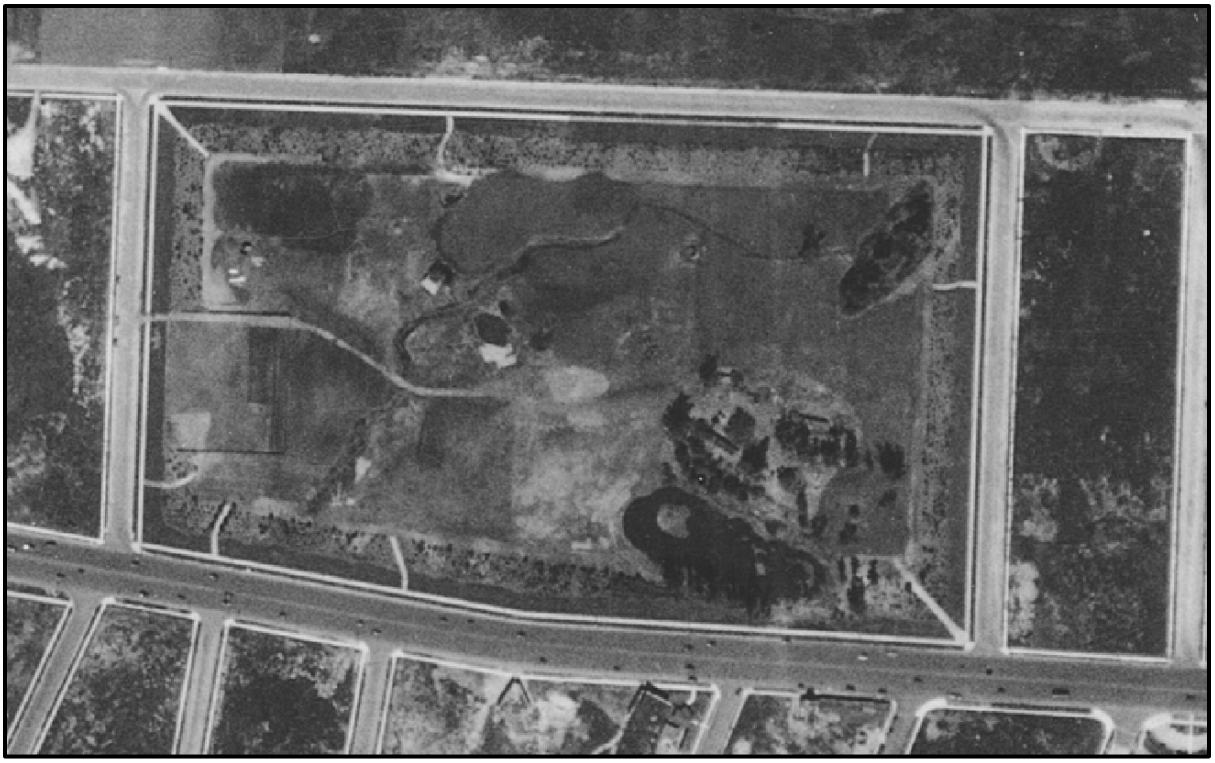
The County Board of Supervisors approved the plan in 1927. This initial scope of work involved clearing and grading a border around the perimeter of the park with some access paths that extended from the surrounding streets, primarily at the corners of the property.[90] This 75-foot-wide setback from the street remained one of the only developed aspects of the property for several years. An aerial photograph from 1928 exhibits these conditions (Figure 26), though there appears evidence of grading occurring towards the center of the property. This likely corresponds with utility upgrades to the property, which included the placement of water mains and conveyance infrastructure as part of the stream restoration.[91]

[89] Bartlett, 1927.

[90] Bartlett, 1927.

[91] "Beauty Reigns in Pit of Doom," *Los Angeles Times*. September 8, 1928. ProQuest Historical Newspapers. Available at: https://www.proquest.com/latimes/index

Figure 26. 1928 aerial photograph of Hancock Park, illustrating the limited redevelopment of the original 32-acre property donated to the County



Source: Environmental Data Resources, 2022

With the onset of the Great Depression in 1930, progress in implementing the 1926 plans for Hancock Park largely stalled. Improvements completed in the 1930s include construction of meandering pathways and a complex with a groundskeeper residence and maintenance building at the western edge of the property along Ogden Drive. One notable addition to the park during the 1930s was the installation of stone walls around many of the excavation pits in the northwest corner of the property (remnants of these stone walls appear extant as of 2022).

A bird's eye aerial photograph of the property, ca. 1935, shows these conditions (Figure 27). The stone masonry walls surrounding the excavation pits were constructed in a rustic style with rough stonework. The walls extended around the circumference of the most prominent excavation pits and were occasionally integrated into other site features, including a stone masonry bridge that was integrated into the stone walls and allowed for visitors to cross and directly observe the excavation pit (Figure 28).

Figure 27. Aerial photograph of Hancock Park, northwest perspective, ca. 1935

Source: Los Angeles Public Library

Figure 28. Visitors observing tar pits from stone masonry bridge (left) and overview of Hancock Park, with stone walls and site features around the excavation pits (right), 1936; as of 2022, some of the stone walls appear extant in the northwestern quadrant of the park

Source: UCLA Digital Collections

During the Great Depression, while development of Hancock Park had shown signs of progress through the 1930s, with some landscape improvements and addition of hardscape and site features, the

implementation of larger plans remained stalled (Figure 29). By the late 1930s, the County had developed plans for new pathways and the expansion of existing circulation paths. New Spanish Colonial Revival-style comfort stations were to be constructed as well, along with new drainage and water conveyance systems, repairs to/expansion of stone masonry walls, enclosures around statues depicting the prehistoric animals, as well as the replacement and upgrades to the stone masonry dam pedestrian bridge.[92]

Figure 29. Aerial photograph of Hancock Park, 1938

Source: Environmental Data Resources, 2022

In 1940, plans were commissioned by the County Board of Supervisors with grant support from the Works Progress Administration to reimagine and reorganize Hancock Park as a "paleontological park and museum."[93] The proposed plan for the park featured an Olmstedian layout, similar to the Thiene and Wright plan prepared in 1916, complete with meandering pathways through the site, spurring off from the primary entrances and a primary circular pathway (Figure 30). Proposed improvements included a new picnic area and shelter in the northeast corner; expansion of comfort station facilities; reconfiguration of the pit areas; a new meadow and open space at the eastern portion of the property; a historical garden and various didactic installations; shifting the primary entrance to Hancock Park at the southeast corner at Wilshire Boulevard and Curson Avenue; and a robust planting program that would extend throughout the site and frame designated areas where statues depicting prehistoric animals would be reorganized for viewing. Elements planned for retention at the time included the groundskeeper residence, maintenance building, and service yard at the western portion of the property, as well as the original Hancock ranch house (Figure 31).

[92] County of Los Angeles, Mechanical Department. 1938. Drawing Set, "Improvements to Hancock Park" (November 30, 1938), Sheets A-1 through A-4.

[93] "Museum Urged at La Brea Pits," *Los Angeles Times,* April 24, 1940.

Figure 30. Development plan for Hancock Park, 1940

Source: Los Angeles Natural History Museum

The 1940 Development Plan for Hancock Park, developed by County engineers and landscape architects, was officially adopted by the County Board of Supervisors in May of that year. Initial publications announcing the plans state that the modest museum building would be constructed first. Funded in part by the WPA, the museum and other initial improvements were slated to occur that year with the remaining landscaping and realization of the plan happening the year after.[94]

However, soon after the construction timeline was publicized, the WPA delayed the project due to concerns of cost overruns and issues surrounding the museum and the potential for gases from the excavation pits causing increased risk of fire.[95] The resulting delay extended into 1941, and with the advent of Pearl Harbor and the US entry into World War II, any additional development of the park was halted. The park would primarily remain in its existing condition until the post-World War II era.

[94] "Tar Pits Park Plan Speeded," *Los Angeles Times*, May 16, 1940.

[95] "Plan for County Building over Tar Pits to be Discussed," *Los Angeles Times*, October 14, 1940.

Figure 31. Visitors overlooking the primary Lake Pit in 1941, note the perimeter fencing and the original Hancock Ranch complex in the back-right

Source: Los Angeles Public Library

POST-WORLD WAR II PERIOD (1945–1955)

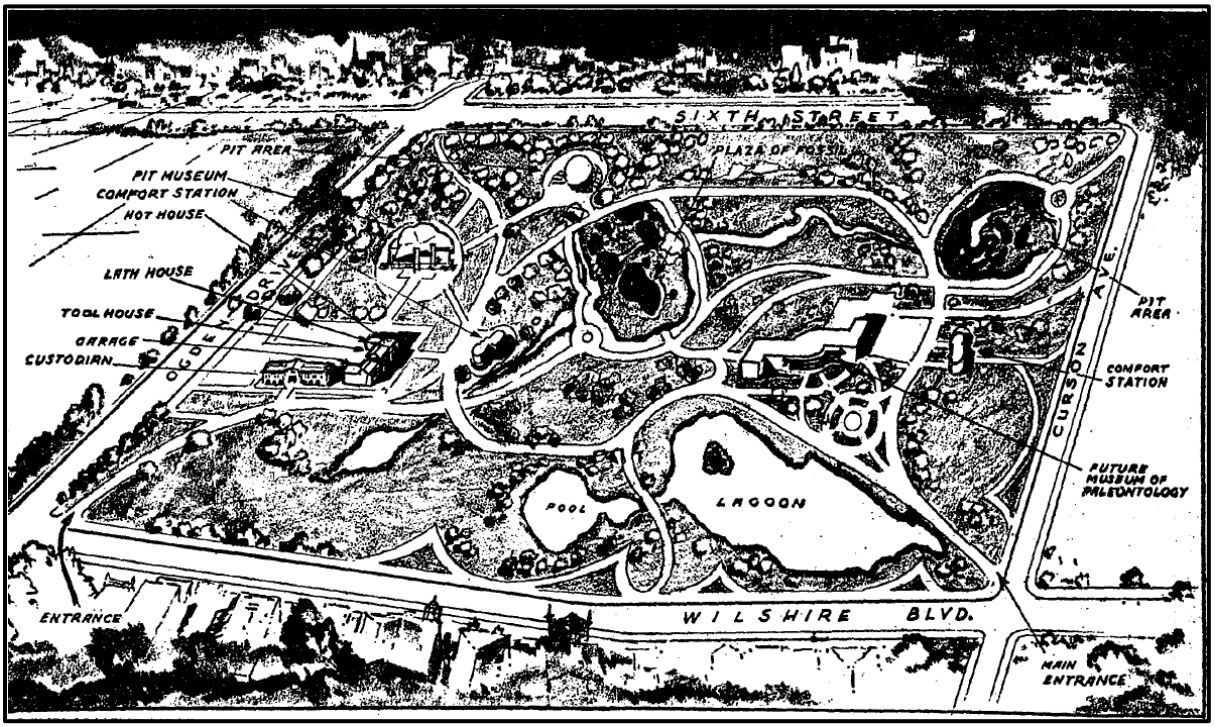
Following the end of World War II, attention returned to the conditions of Hancock Park. In 1946, the Los Angeles County Museum of History, Science, and Art (the predecessor to the Natural History Museum) began geotechnical investigations with dozens of test wells drilled throughout the site in anticipation of future development. These test bores ultimately led to the discovery of new fossil deposits, which in turn led to renewed excavation.[96] At this time, the County commissioned architect and landscape planner Harry Sims Bent to develop a new master plan for the property. Unlike previous attempts to redevelop Hancock Park, the 1948 plan would outline a four-phased approach that would gradually redevelop the park over an 8-year period (Figure 32).

The grand vision of the 1948 plan bore some similarities to previous designs, with meandering paved pathways extending throughout the property to create a picturesque environment. Other improvements included the restoration of the waterways, stream, and Lake Pit; construction of new comfort stations; a new observation pit museum over one of the excavation pits; a new museum of paleontology; and a complete redevelopment of the existing excavation pit enclosures with a new plaza around the main concentration towards the northwest corner of the park. Other initiatives included the installation of interpretive displays and educational materials. The overall landscape was intended to be redeveloped to evoke the sense of a Pleistocene environment, reflecting previous visions for the park.[97]

[96] "Animal Bones 50,000 Years Old Found in Tar," *Los Angeles Times*, June 17, 1946.

[97] "Hancock Park Tar Pits Project to Start Soon at $738,400," *Los Angeles Times*, September 19, 1948.

Figure 32. Conceptual, birds-eye illustration of the 1948 plan



Source: Los Angeles Times, 19 September 1948

Construction of the first phase of the 1948 plan was initiated the following year (Figure 33). Work included general site and utility upgrades, as well as the construction of comfort stations and an initial observation platform overlooking one of the excavation pits.[98] Subsequent work took place over the next 3 years, including the completion of the Observation Pit museum, a Mid-Century Modern style pavilion that enclosed Excavation Pit 101 and allowed visitors to descend to a viewing platform. Other projects included reorganization of the circulation paths; restoration of the streambed with new small footbridges; renewed irrigation; and landscape lighting throughout the property.[99] New plantings were also added; all plantings were picked based upon the notion that they may have existed at the site during the Pleistocene period.

Construction on the site presented numerous challenges, primarily related to the tar seepage and water drainage issues throughout the site. While regrading attempted to address many of these issues, some tar pits were filled in, occasionally requiring reopening after seepage problems persisted. However, in 1952, the first phase of the 1948 master plan prepared by Bent was largely complete and the updated Hancock Park was officially opened to the public.[100]

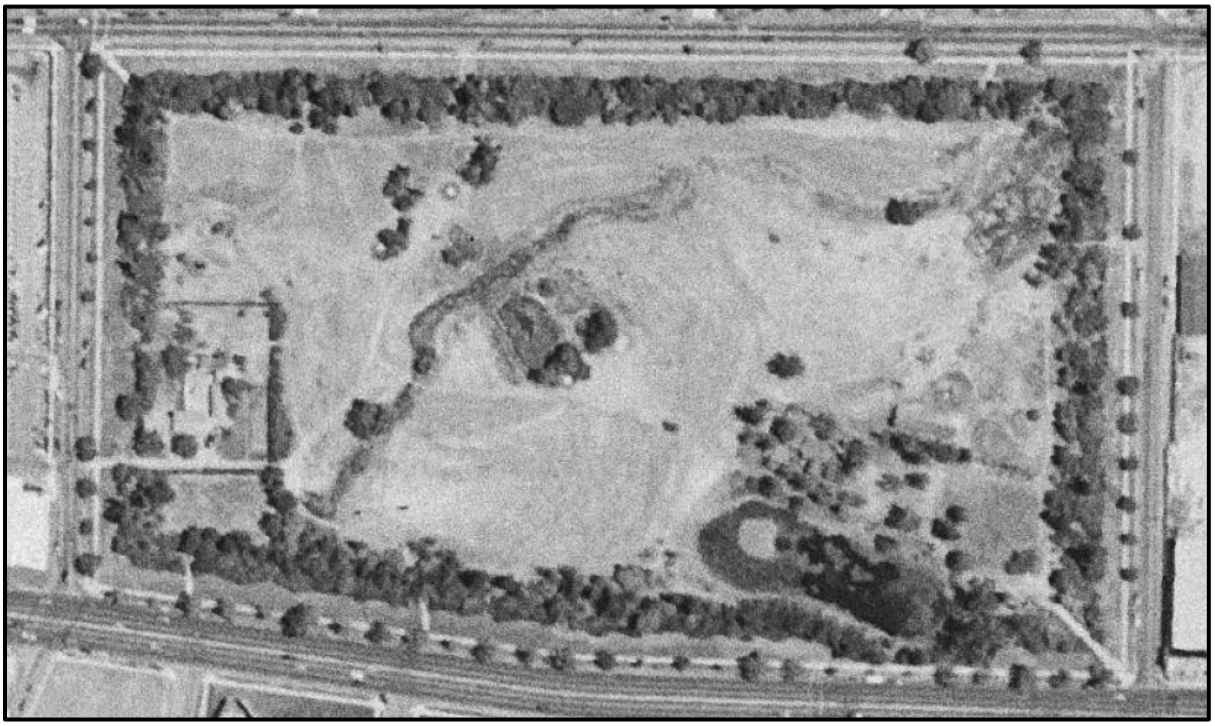
Development of subsequent phases of the 1948 plan largely stalled after Hancock Park was opened in 1952. Continuous plans were prepared for the museum throughout the course of 1950s, reflecting a mixture of Revival and Modern architectural styles. However, these too would not come to fruition, leaving the park with its 1952 configuration (Figure 34).

[98] Conover, A. 1949. "Roaming Around with Austin Conover – Hancock Park Said 16 Per Cent Finished," *Hollywood Citizen News*, October 10, 1949.

[99] "Hancock Park Opened After Landscaping Job," *Los Angeles Times*, April 24, 1952.

[100] "Hancock Park Opened After Landscaping Job," *Los Angeles Times*, April 24, 1952.

Figure 33. 1948 aerial photograph of Hancock Park. The landscape at this time is consistent with conditions exhibited in 1938, albeit with mature plantings and increased urban development in the surrounding neighborhood



Source: Environmental Data Resources, 2022

Figure 34. 1952 aerial photograph illustrating the phased execution of the 1948 plan, including the reconfigured circulation paths, the construction of the Observation Pit museum, and ongoing grading and other site improvements

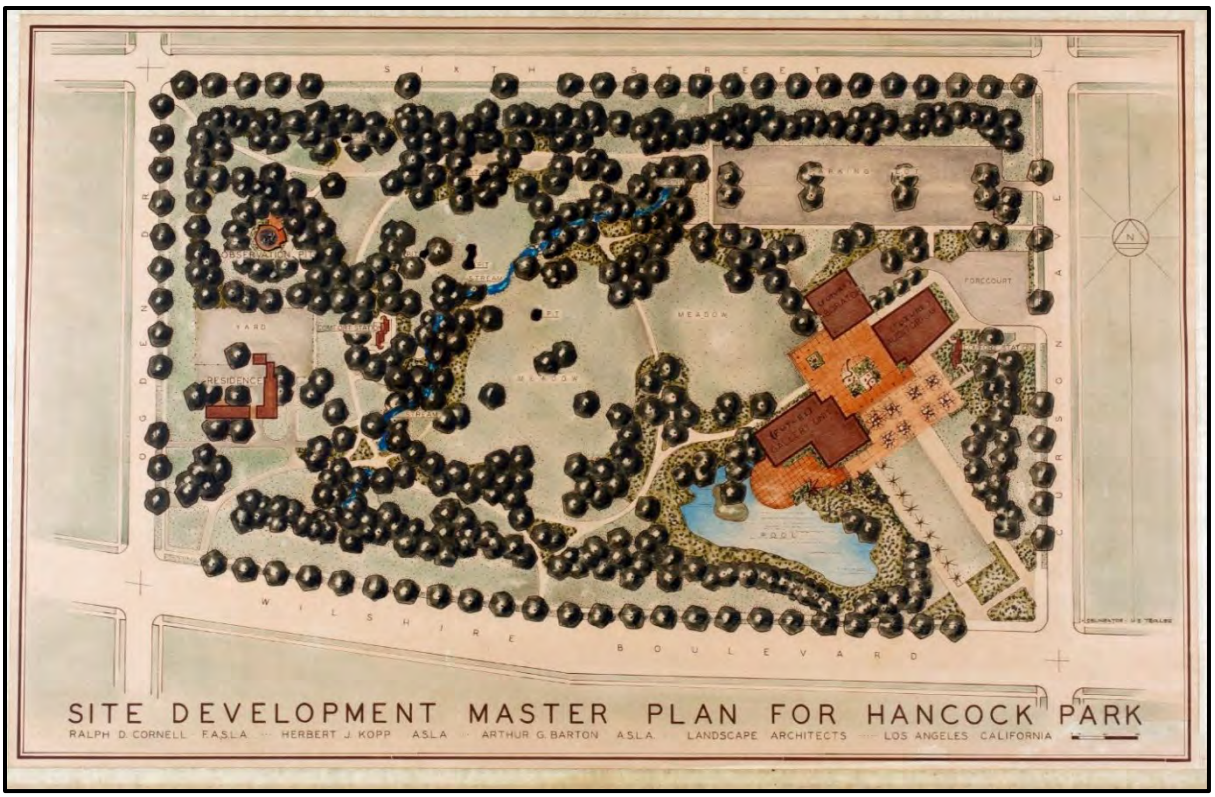
Source: Environmental Data Resources, 2022

REDEVELOPMENT ERA AND FOUNDING OF THE LOS ANGELES COUNTY MUSEUM OF ART (1956–1974)

In 1956, the County celebrated the 50-year anniversary of the initial excavations of the La Brea Tar Pits with a ceremony at Hancock Park. To mark half a century of scientific exploration, which by 1956 had yielded more than 500,000 fossil bones of prehistoric animals, the celebration included Supervisor John Anson Ford, Dr. Hildegarde Howard, chief curator of science at the Los Angeles County Museum, and Dr. Jean Delacour, Los Angeles County Museum of History, Science, and Art director. Festivities included a performance by the Los Angeles County Band and a guided tour of Hancock Park and the La Brea Tar Pits.[101]

At the same time, though the La Brea Tar Pits and park remained scientifically relevant and remarkably popular with the public, plans for a permanent museum still had not come to fruition. In 1958, the County returned to the question of Hancock Park and its next phases of development. The County commissioned landscape architect Ralph D. Cornell to prepare a plan that would build on the completed work of the 1948 plan, leaving the western portion of the park intact, while revisiting the eastern portion (Figure 35). The 1958 Cornell plan included more Modern and formal interventions, included an axial promenade entrance into the park from the southeast corner, a rambling museum complex layout with a central courtyard and cantilevered terrace extending out over the Lake Pit, and a surface parking lot located at the northeast corner.

Figure 35. 1958 Master Plan for Hancock Park, prepared by Ralph D. Cornell and Associates



Source: Los Angeles Natural History Museum

[101] "La Brea Tar Pits Marks 50 Years of Digging," 12 March 1956, *Los Angeles Times*, ProQuest Historical Newspapers.

Los Angeles County Museum of Art

During the Great Depression, in the mid-1930s, the Los Angeles County Board of Supervisors had explored the possibility of adding a fine arts center and museum to Hancock Park. Lamenting a lack of significant fine arts facilities for both music, displaying fine arts, and arts education, the County announced its plans and started to seek donations for new facilities that would rival those in major East Coast cities. The County saw Hancock Park as an ideal location, albeit with the supplemental addition of an adjacent 20 acres to accommodate concert halls and fine arts galleries.[102]

Because the addition of such facilities did not comply with the initial stipulations of the Hancock Park land gift, the County Board of Supervisors passed a resolution to establish a fine arts complex at the park and deeded the property back to G. Allen Hancock. which could then be re-gifted to the County with stipulations about use as a park removed, allowing for the estimated $15-million facility to move forward.[103] These early visions called for a collection of auditoriums, fine arts-focused schools, art galleries, concert halls, and an institution for motion pictures, radio, and television. These would supplement the ongoing plans to establish a museum on the Hancock Park property dedicated to the exhibition of the tar pit fossils.[104] However, the plans were ultimately stalled until the late-1950s when the County began to reexplore adding a fine arts complex to the property.

The 1959 feasibility study for adding a new fine arts museum to Hancock Park was prepared. Building upon the Cornell plan developed that same year, the feasibility study examined adding the new art museum to the southwest corner of Hancock Park, directly south of the Observation Pit. Initial site plans developed as part of the feasibility study show a re-envisioning of the southwest corner with a Modern style facility and expansive surface parking lot that would front Wilshire Boulevard and extend towards the center of Hancock Park. The plans also showed the reconfiguration of the 1952 pathway network and new security fencing around the remaining open excavation pits and Lake Pit. The combination of the 1958 Cornell plan and the 1959 art museum feasibility study was largely conceptual, but provided sufficient information for the County to move forward with the plan of constructing a new Los Angeles County Museum of Art at the southwest corner of Hancock Park.[105]

In 1960, the County commissioned renowned Modernist architect William L. Pereira to develop a master plan for Hancock Park, the scope of which would include the development of the new fine arts museum complex, a new paleontological museum, and associated landscape plans and improvements throughout the property.[106] The resulting 1961 Pereira plan for Hancock park envisioned the park as a purely Modern landscape, complete with the art museum complex and a new concept for the paleontological museum, which included a prominent cyclorama integrated into a complex (Figure 36).

The pathways throughout the park were reimagined as irregular and curvilinear approaches that varied in width and enclosed amoebic shaped spaces of lawn. The components maintained from the prior Cornell plan were limited but included the vehicle parking at the northwest corner of the property and the use of an observation terrace cantilevering out from the new museum complex over Lake Pit.

[102] "Art Center Plan Urged – Park Proposed as Site," *Los Angeles Times*, March 24, 1936.

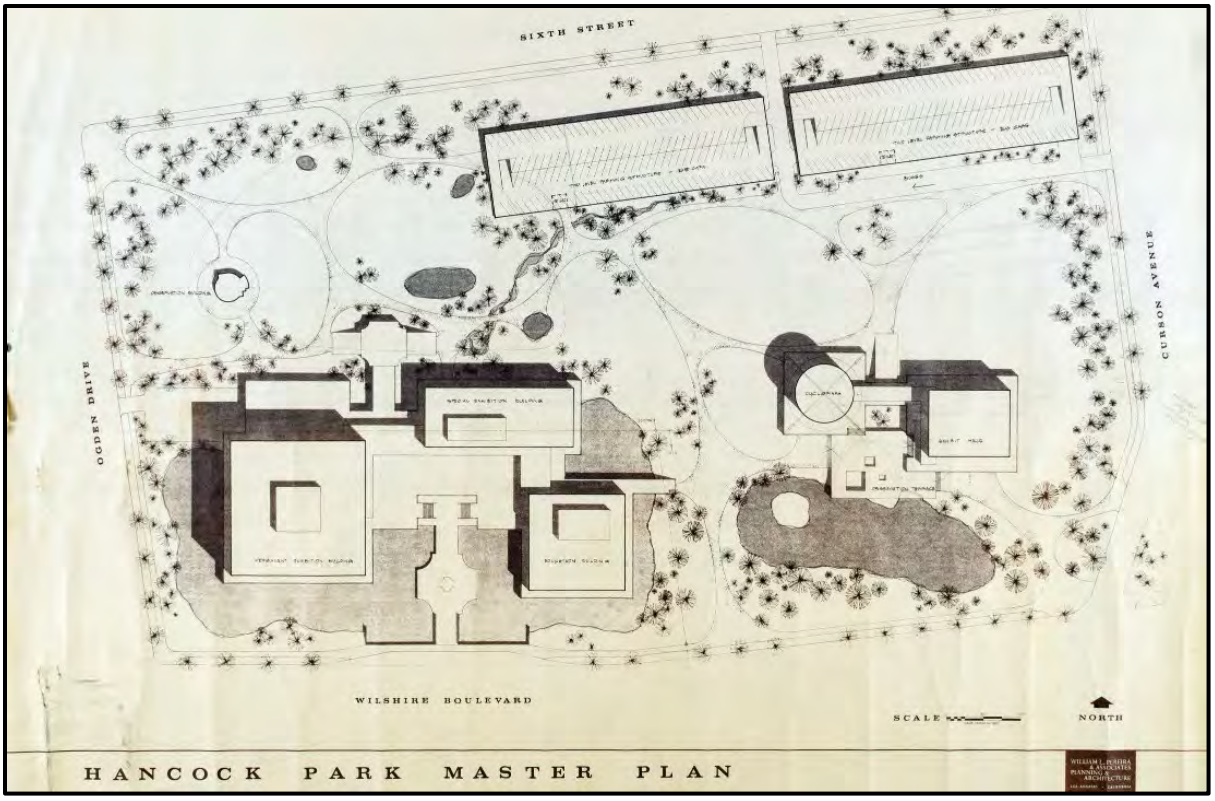
[103] "Park Plan Advanced – County Acts to Push Project," *Los Angeles Times*, April 2, 1936.

[104] "Park Plan Advanced – County Acts to Push Project," *Los Angeles Times*, April 2, 1936.

[105] "Art Museum Assured on Hancock Park Site," *Los Angeles Times*, July 1, 1960.

[106] "Art Museum Assured on Hancock Park Site," *Los Angeles Times*, July 1, 1960; "Master Plan for Hancock Park in Board Approval," *Hollywood Citizen News*, April 12, 1961.

Figure 36. 1961 Hancock Park Master Plan, showing LACMA and proposed paleontology museum, William L. Pereira & Associates



Source: Los Angeles Natural History Museum

While the 1961 Pereira plan was approved by the County, the execution was primarily focused on the construction of the new LACMA facilities, which had received millions of dollars in private donations in addition to county support. The proposed paleontological museum, however, had no funding allocated for its construction.[107] Over the following years, LACMA would be under construction as planned while alterations and improvements to Hancock Park would be greatly reduced.

Aerial photographs of Hancock Park in 1962 illustrate some of the changes that occurred during this period (Figure 37). Most notably, the construction of the surface parking lot in the parcel's northeast corner had been completed, and some of the landscape had been redeveloped, resulting in the removal of the 1948 Bent plan, with its Olmstedian circulation pattern, with a more streamlined network of pathways.

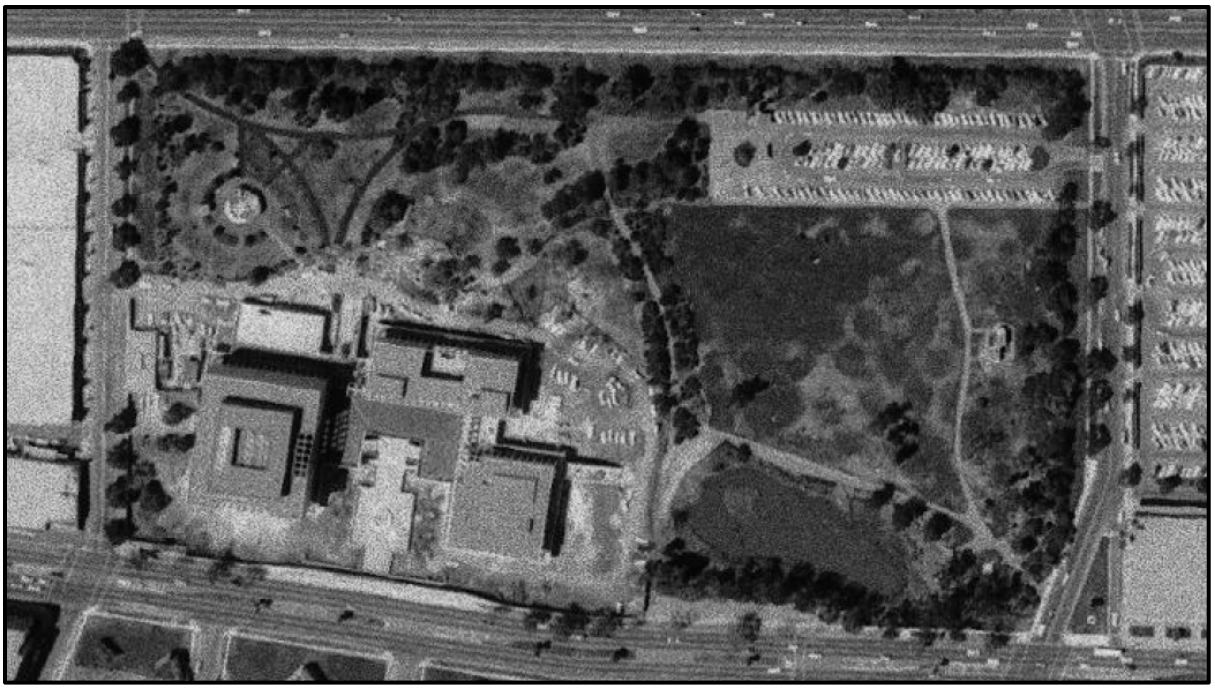
The conditions exhibited in Figure 37 illustrate a simplified, more direct network of pathways, particularly leading from the parking lot to the renewed pathways around Lake Pit. A new comfort station also appears to be present in this photograph (though, to date, source material on the origins and details of this building has not been identified). The photographs also depict the installation of chain-link perimeter fence around the Lake Pit. An aerial photograph from 1964 (Figure 38, upper photograph) depicts these conditions and the ongoing construction of LACMA in the southwest corner. Additionally, the photograph shown in appears to show the landscape around the Observation Pit, constructed in 1952.

[107] "Museum of Tar Pit Fossils Proposed," *Hollywood Citizen News*, January 11, 1961; "Fossil Museum for Tar Pits Gains Backing," *Hollywood Citizen News*, May 10, 1961.

Figure 37. 1962 aerial photograph of Hancock Park, east perspective (top) and northwest quadrant, east perspective (bottom)

Source: Los Angeles Public Library

Figure 38. LACMA under construction in 1964, view facing west across Lake Pit (top) and 1964 aerial showing LACMA in western portion of Hancock Park



Source: Los Angeles Public Library

By the late 1960s, following the completion and fanfare of LACMA, the plans for a paleontological museum at Hancock Park again went dormant. However, the Museum of Natural History began exploring other options for activating areas of the park adjacent to the new LACMA campus and increasing the interpretive component.

In 1967, a new development plan was prepared, which included revisiting the concept of the Pleistocene Garden with meandering pathways, lush plantings, and groupings of new fiberglass statues of prehistoric creatures throughout the park, including along the shores of the Lake Pit, as well as creating multiple new entrances to the park from the adjoining streets. As before, the plans were largely scaled down, but the County moved ahead with commissioning 52 new statues for the park, which included the mammoth sculptures within the Lake Pit, which have become iconic features of the La Brea Tar Pits.[108]

By 1969, rumors were circulating that LACMA was looking to expand further into Hancock Park. Reaction to any such potential expansion, however, was strong, particularly from County Supervisor Kenneth Hahn, who argued against potential infringement of the tar pits and any possible disagreement with Hancock's original agreement with the County.[109] The topic was also controversial enough that the *Los Angeles Times* published a number of articles on the possible threat to the tar pits and park site.

While LACMA officially denied the rumors, the response was strong enough that the Board of Supervisors ultimately passed a resolution in 1969 guaranteeing that Hancock Park and the tar pits would be preserved.[110] In this period, renewed interest in the tar pits during the mid-1960s led to its designation as a National Natural Landmark and to the expansion of scientific excavations on the property.[111]

Starting in 1969, these new excavations brought multiple new pits immediately to the rear of LACMA at the center of Hancock Park. The excavations included varied infrastructure, such as shaft structures to stabilize the pit walls, shelter structures, and observation platforms. While originally intended to be temporary in nature, these collections of structures associated with the La Brea project digs would remain on the property over the following decades (Figure 39).[112]

[108] "18-foot High Mammoth – First of 52 'Beasts' Put in La Brea Pits," *Los Angeles Times*, May 30, 1968.

[109] "Hancock Park – Tar Pits Must Be Preserved," *Hollywood Citizen News*, March 31, 1969.

[110] "Art Museum Won't Take Tar Pit Area," *Los Angeles Times*, May 11, 1969

[111] Holliday, K. 1972. "Bay Tar Preserved – The Bones of Contention," *Los Angeles Times*, July 30, 1972.

[112] Hunter, P. 1977. "Sizing Up Tar Pits Museum: Sticky Business," *Los Angeles Times*, April 18, 1977.

Figure 39. Working excavation at Hancock Park, with observation platform, 1976

Source: Los Angeles Public Library

RECENT MASTER PLAN CHANGES AND NEW CONSTRUCTION (1975–PRESENT)

Following the completion of LACMA in the mid-1960s, attention began to shift again to the construction an on-site museum in Hancock Park dedicated to the exhibition of the fossils found in the tar pits. Throughout the postwar period, multiple concepts for the museum were developed, ranging from Renaissance Revival style structures to more Modern creations, including the cyclorama complex concept designed by William L. Pereira & Associates. However, lack of funding continued to stymie any plans for a tar pits museum. A simplified concept was developed in the late 1960s, though these plans did not progress beyond preliminary conceptual compositions. As with LACMA a decade prior, the long-drawn-out plans for a tar pits museum in Hancock Park needed private funding.

In the early 1970s, George C. Page, a successful industrialist and benefactor of the Museum of Natural History, donated several millions of dollars to the County in support of a paleontological museum. Having visited Hancock Park when he was younger, Page was fascinated by the tar pits and its fossils. As part of the donation, Page would provide much of the required funding, while the County would provide the land, develop the utilities and landscaping, and provide staffing for the facility. Page would also be heavily involved in the design process for the museum, which was completed and open to the public in the spring of 1977 (Figure 40). (The Page Museum is described in more detail below.)

Along with the construction of the Page Museum and its distinctive pyramid-like site, the landscape around the tar pits was reconfigured. New pathways and circulation pathways were constructed around the square plan of the building, hugging the west and south berms. The entrance to the museum, which descends to the north, was serviced by a new axial promenade that extended from the southeast corner of

Hancock Park and met a paved plaza adjoining the museum entrance progression and the walkways around the Lake Pit. A new concrete observation deck structure was constructed along the northeast corner of Lake Pit, providing visitors an elevated vantage point to view throughout the park.

Following the completion of the Page Museum and the realization of the long-awaited goal of having a paleontological specific facility, changes to Hancock Park and the tar pits were slowed over the following decade. Notable plans were developed, including for underground parking structures, but these were not constructed. As illustrated in an aerial photograph from 1989 (Figure 40, lower photograph), the most significant changes to Hancock Park came from the expansion of LACMA, which saw the construction of new additions to the complex. A rear addition to LACMA resulted in the reconfiguration of the pathways related to the Observation Pit, and the Bruce Goff designed Japanese Arts Pavilion was constructed immediately northeast of LACMA and west of Lake Pit. Completed in 1989, the Japanese Arts Pavilion was one of the largest interventions in Hancock Park in the 1980s.

Through the 1980s, the La Brea Tar Pits and Page Museum were one of the principal attractions along Miracle Mile, in the emerging district known as Museum Row. While the destination remained popular with tourists, school groups, and locals alike, Hancock Park was viewed as outdated, and the County began exploring new plans for the park to create a more attractive space for contemporary audiences.[113]

In 1993, a bond to renovate Hancock Park was issued.[114] The following year, the landscape architecture firm Hanna/Olin prepared a master plan for Hancock Park to address these concerns and provide new direction. The 1994 master plan identified immediate issues and provided long-term direction for the park's future evolution. In addition to addressing the plantings, irrigation, and lighting program, the 1994 master plan addressed site circulation. Specifically, it recommended replacing the mixture of axial pathways at the eastern portion of the park around the Page Museum and utilizing curvilinear pathways, reminiscent of the various Olmstedian plans that were developed decades earlier.[115]

These paths could be integrated into the western portion of the site, which partially retained its original 1952 configuration and was noted as needing replacement, due in part to accessibility issues. The plan also noted that the 1962 chain-link security fencing around tar pits and Lake Pit were aesthetically unpleasing and needing replacement with more attractive fencing materials, in addition to various other site feature improvements, such as new benches, interpretive materials, and a new food pavilion.[116] Unlike previous plans for Hancock Park, major components of this plan would be realized.

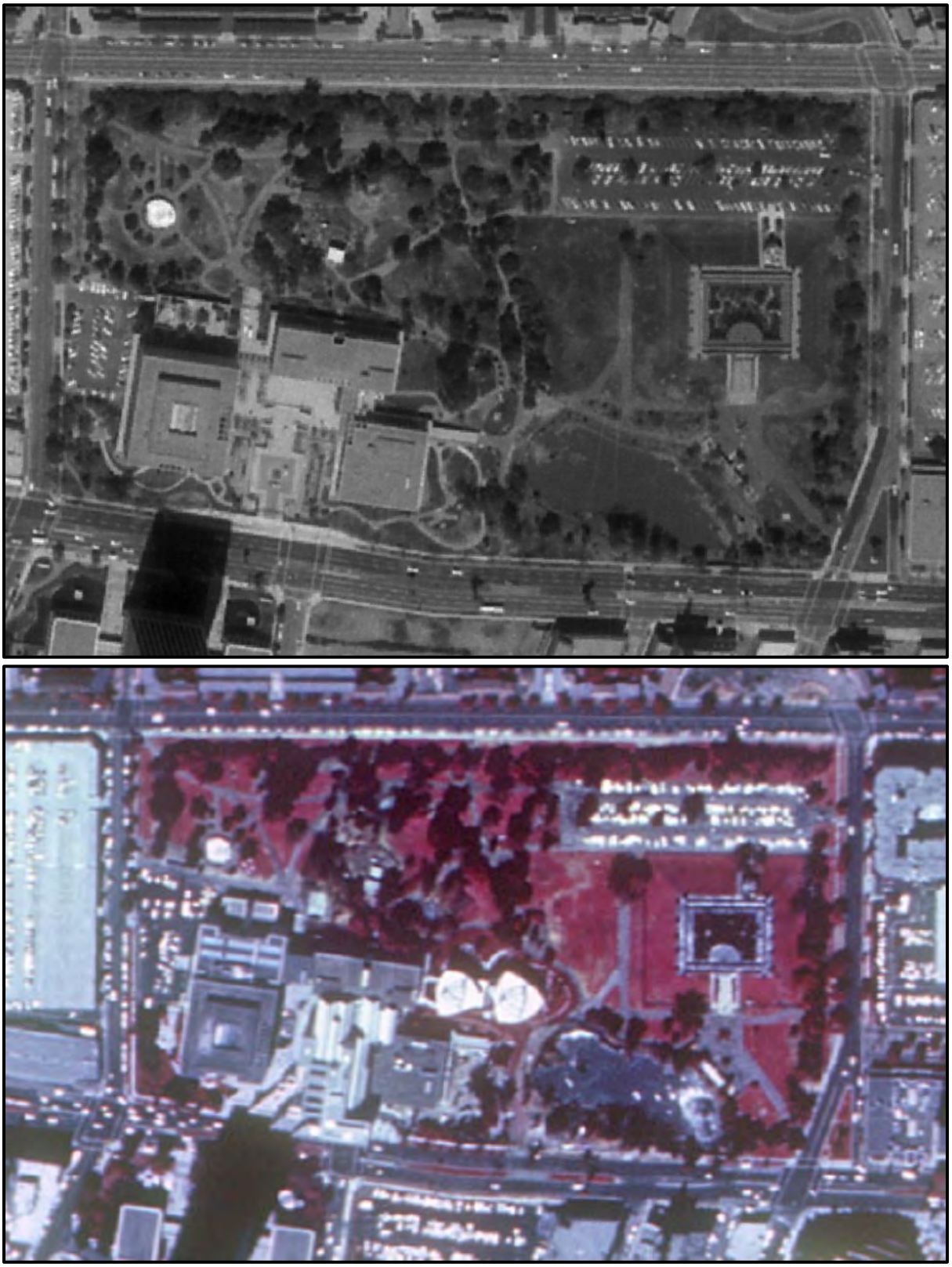
[113] Hanna/Olin, Ltd. 1994. *Hancock Park Master Plan*. Prepared for Los Angeles County Museum of Art.

[114] Muchnic, S. 1917. "Museums Rediscover Beauty, Right in Their Own Backyard," *Los Angeles Times*, July 7, 1917.

[115] Hanna/Olin, Ltd., 1994, pp. 33–39.

[116] Hanna/Olin, Ltd., 1994, 49–52.

Figure 40. Aerial photographs from 1977 (top) and 1989 (bottom) of Hancock Park, up is north



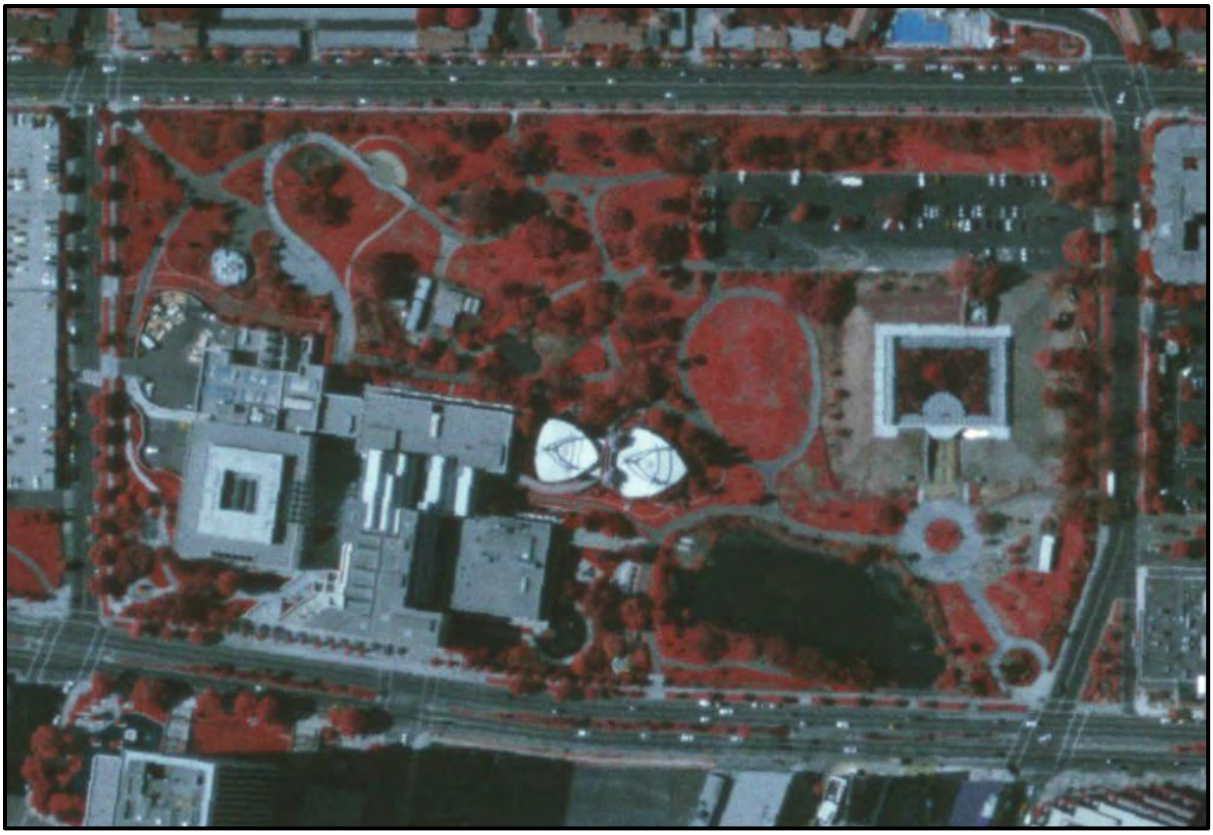
Source: Environmental Data Resources, 2022

By 1998, redevelopment of Hancock Park per the 1994 master plan was underway. This effort resulted in a reconfiguration of the pathways throughout the park, with new serpentine and curvilinear orientations, construction of new comfort stations, addition of an amphitheater and seat wall installations at the northwest corner. Other project components included a new picnic area, reconfiguration of existing statues and monuments, stream restoration, irrigation improvements, over 60,000 new plantings, and installation of a new steel picket security fence.

The plaza south of the Page Museum was also redeveloped, and the Lake Pit observation deck was removed. New foot bridges along Lake Pit and Oil Creek, along with new wayfinding and interpretive signage, helped enhance the visitor experience to the park. Finally, with a redeveloped southeast entrance to Hancock Park, with a circular entrance plaza, the rebranding of Hancock Park in general and the La Brea Tar Pits in particular was complete.[117] The goal was to create a parklike atmosphere that could cater to both nearby residences, as well as visitors to LACMA and the La Brea Tar Pits.

The renovated landscaped provided multiple amenities that could cater to both the arts and sciences, reflective of the major institutions within the park's vicinity, as well as general recreation and enjoyment. This was partially achieved through substantial grading throughout the site, in order to create 340,000 square feet of gently rolling landscape and contours. The renovation was completed in 1999 (Figure 41).

Figure 41. 2002 aerial photograph of Hancock Park, exhibiting conditions associated with the 1999 renovation of the landscape; north is up



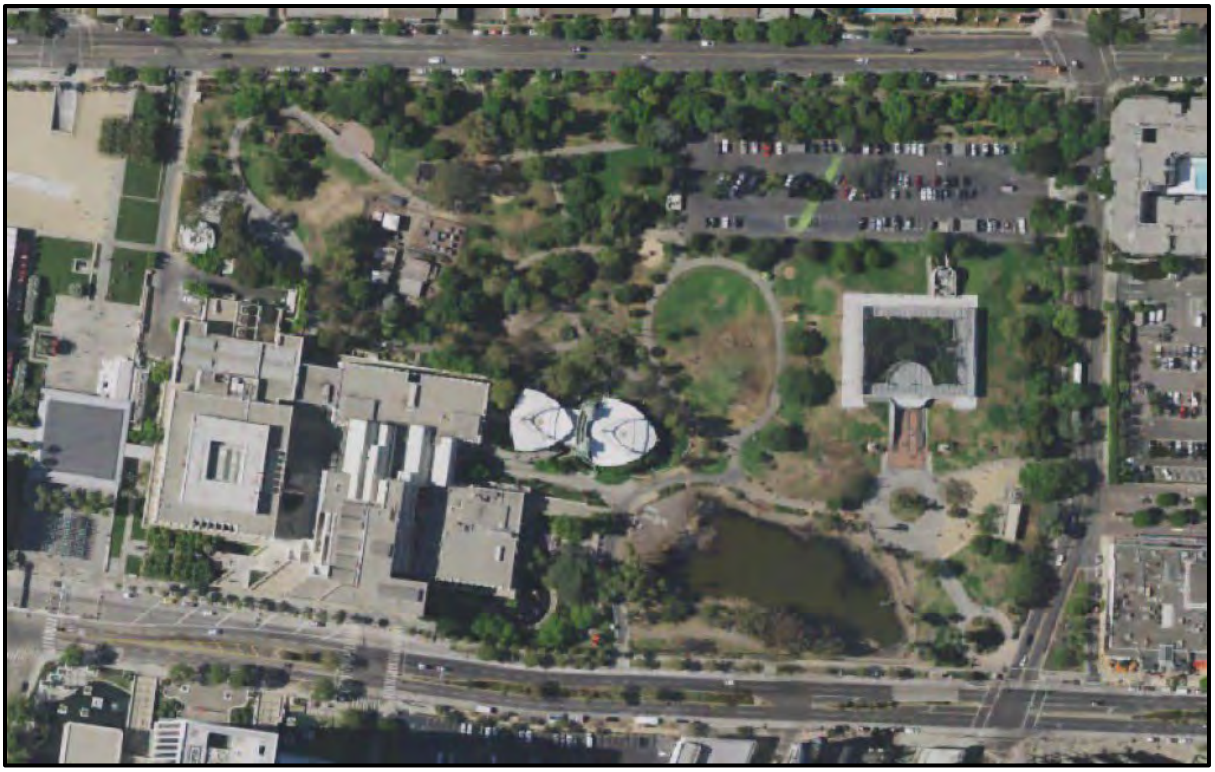
Source: Environmental Data Resources, 2022

[117] Muchnic, 1917.

In 2014, the firm Suisman Urban Design completed additional improvements to Hancock Park. The majority of the work involved included cosmetic refurbishment, including refurbishing the Observation Pit, installing new lighting, renovating the existing comfort station, replacement of interpretive signage, expanding, reconfiguring, and adding temporary structures to various excavation areas.[118]

In its current form, Hancock Park reflects master planning initiatives and campaigns from various periods in the park's history. While much of the landscape reflects more recent campaigns (as noted above), the park's character and use as an urban open space protected and reserved for scientific exploration, curation, education, and public use, have remained intact for more than a century. The sparsely developed, 23-acre parcel, still framed with mature trees and landscaping, remains intact, reflecting the original agreement between the Hancock family and the County. This agreement protected this large parcel from subdivision and development even as the surrounding neighborhood and the Mid-Wilshire corridor became densely built-up. The park retains numerous natural features and resources, including the Lake Pit and excavation pits, buildings, structures, circulation corridors, hardscaping, natural features, cultural and paleontological resources, and site plan features reflecting Hancock Park's history as "Pleistocene Park." Although the landscaping, facilities, and topography have been altered through the years, Hancock Park reflects a development history that is unique in Los Angeles: from the early years of oil exploration and fossil discovery, to the gradual establishment of cultural and curatorial/educational institutions to tell its story from the Pleistocene era, through post-World War II expansion, and recent upgrades and master planning efforts (Figure 42).

Figure 42. 2016 aerial photograph of Hancock Park; north is up



Source: Environmental Data Resources, 2022

[118] Suisman Urban Design. 2022. Reimagining the La Brea Tar Pits. Available at: https://suisman.com/portfolio/reimagining-the-la-brea-tar-pits/.

La Brea Tar Pits Museum and Grounds

The La Brea Tar Pits Museum and surrounding grounds are located within Hancock Park. As noted above, since the discovery of fossils and subsequent donation of the 23-acre parcel to the County, Hancock Park has been reserved and preserved for use as an open space and for ongoing excavations, curation, education, and open space for nearly a century.

While the previous sections detailed nearly a century of development and evolving master planning efforts at Hancock Park in general, this section focuses on the context and development of the La Brea Tar Pits Museum and Grounds, with a focus on extant facilities.

OBSERVATION PIT

The first institutional facility constructed at the property was the Observation Pit, completed in 1952 as part of a 1948 Master Plan. A larger museum had been proposed for the area north of Lake Pit as well, though lack of funding and an increased emphasis on LACMA constructions by the late 1950s and into the 1960s stalled further expansion.

Designed in the Mid-Century Modern style, the Observation Pit consists of a semi-circular, single-story building in Hancock Park's northwest corner (Figure 43 and Figure 44). The building was the park's first purpose-built facility devoted to the interpretation of the paleontology of La Brea Tar Pits. The building has an enclosed observation area, in which visitors descend to a below-grade platform overlooking the exposed excavation pit known as "Pit 101." Here, fossil remnants of prehistoric animals, trapped in tar, were (and remain) visible to both scientists and visitors; the building facilitated the critical purpose of Hancock Park going back to the 1920s, to reserve and preserve the park's resources for interpretive and educational purposes.[119]

Figure 43. Observation Pit, ca. 1952, west perspective

Source: La Brea Tar Pits & Museum, Natural History Museums of Los Angeles County

[119] Conover, 1949.

Figure 44. Interior of the Observation Pit, 1964 (left) and 1967 (right)

Source: Los Angeles Public Library, Photograph Collection

The building would serve as the primary museum building for the La Brea Tar Pits from its construction until the completion of the George C. Page Museum in 1977. It would remain open to the public until the mid-1990s, when the museum began focusing resources on excavating other portions of the property and security concerns about the priceless fossils were raised. The Observation Pit would remain closed until 2014, when it was repainted, the clerestory windows were uncovered, and the building was reopened to the public.[120]

Architect | Harry Sims Bent

Harry Sims Bent was an architect, landscape architect, and planner who operated primarily in California and Hawaii during the first half of the twentieth century. In addition to designing numerous buildings, Harry Sims Bent is known for his involvement with several master planning efforts for parks and instructional campuses. His wholistic approach and multi-faceted design experience resulted in cohesive plans and compositions where buildings were successfully integrated into broader landscapes.

Born in New Mexico in 1895, Bent moved with his family to South Pasadena via Colorado during the early 1910s. Bent graduated from South Pasadena High School in 1914, after which he would attend the University of Pennsylvania to study architecture. After completing his studies, Bent began working for Bertram Goodhue Associates, ultimately moving back to the Pasadena area where he would work on many of Goodhue's Southern California commissions, including the Los Angeles Public Library (1924), the California Institute of Technology's (Cal Tech) Campus Master Plan, and many of the individual Cal Tech buildings.[121]

[120] "Observation Pit," La Brea Tar Pits & Museum. Available at: https://tarpits.org/experience-tar-pits/observation-pit. Accessed May 3, 2022; Stallworth, L., "La Brea Tar Pits Observation Pit Reopens After 2 Decades," *ABC 7 Los Angeles*, June 19, 2014. Available at: https://abc7.com/la-brea-tar-pits-page-museum/125358/. Accessed May 3, 2022.

[121] Blanchard, G. 2013. *National Register of Historic Places Registration Form – Mother Waldron Playground, Honolulu, Hawaii*, p. 16. Prepared for Honolulu Authority for Rapid Transportation.

In the late 1920s, Bent relocated to Honolulu, Hawaii on behalf of Bertram Goodhue Associates, where he would oversee the construction of the Academy of Arts building, followed by other commissions. However, by the 1930s, Bent was primarily operating as an independent architect and earned a reputation as one of the most talented architects practicing in Hawaii during the 1930s. Bent was responsible for the design of over 150 residences and other structures throughout Hawaii, which ranged in architectural style from more traditional revivals to increasingly more Moderne compositions, albeit with regionally inspired details and elements. Particularly notable commissions from this period include the C. Brewer Building, Hanahauoulis School, and the Pineapple Research Institute at the University of Hawaii.[122] However, his most celebrated work in Hawaii was through his involvement with the Honolulu Park Board, which hired him as the supervising architect for the design and construction of Ala Moana Park. Funded through the Civil Works Administration, an early New Deal program of the Roosevelt Administration, the park included entrance portals, sports facilities and pavilions, a banyan court, lawn bowling green, a canal bridge, and other features, all composed in a regionally inspired iteration of Art Moderne and Art Deco style. Bent would go on to design numerous parks in Honolulu, including the Mother Waldron Playground, Kawananakoa Playground, and Haleiwa Beach Park.[123]

During World War II, Bent left Honolulu and returned to Pasadena, where he worked independently through the remainder of his career. Bent would continue to design numerous buildings, including single-family residences, but is most well regarded for his master planning and landscape design work. Two of his major commissions in Southern California during this period include the master landscape plan for Hancock Park (1948) and the master plan for the Los Angeles County Arboretum (1950).[124]

Architecture | Mid-Century Modernism

Mid-Century Modernism, or Regional Modernism, represents a middle ground between the formal, machine-age aesthetic of the International Style and a regional idiom reflecting local precedent, materials, topography, and identity. More of an architectural approach than a style, the various strains of Mid-Century Modernism became common throughout the United States in the postwar period, in particular in residential design, with Southern California becoming a world-famous center for modernist design and culture.

In the postwar period through the 1960s, as practiced in Southern California, Mid-Century Modernism took its cues from the region's first-generation modernist architects such as Richard Neutra, Rudolph Schindler, Gregory Ain, Frank Lloyd Wright, and Harwell Hamilton Harris. In the postwar period, second-generation practitioners included Raphael Soriano, Whitney Smith, A. Quincy Jones, and the architect of LACMA, William L. Pereira & Associates, among many others.

Mid-Century Modernism is characterized by an honest expression of structure and function, with little applied ornament. Aesthetic effect is achieved through an asymmetrical but balanced, rhythmic design composition, often expressed in modular post-and-beam construction. Whether wood or steel, post-and-beam construction allowed for open floor plans, ease of expansion, and generous expanses of glazing to heighten indoor-outdoor integration. Regional identity and character are reflected in the use of local materials and the view that extant topography (including sloped sites, landscaping, viewsheds) should be incorporated into the design. Infill panels of wood or glass are common, with glazing often extending to the gable. Buildings are generally one to two-stories, with an emphasis on simple, geometric forms. Capped with low-pitched gabled or flat roofs, a Mid-Century Modern building often displays wide eaves and cantilevered canopies, supported on spider-leg or post supports. Sheathing materials vary, with wood, stucco, brick and stone, or steel-framing and glass. Entrances are typically set flush with the ground, to

[122] Fung Associates, Inc. 2011. *Hawaii Modernism Context Study*, pp. 105–106. Prepared for the Historic Hawaii Foundation. Honolulu, Hawaii.

[123] Blanchard, 2013, p. 16.

[124] Blanchard, 2013, p. 16.

enhance indoor-outdoor integration and to create an informal, domestic-scaled space. Windows are generally flush-mounted, with metal or wood frames.

In terms of materials, Mid-Century Modernism also included a mixture of industrial and natural materials, the latter of which often include locally sourced materials reflective of regional character. While primarily used in residential design, the Mid-Century Modern approach to design was utilized for a wide variety of property types throughout the United States in the postwar period.

GEORGE C. PAGE MUSEUM, 1975–1977

By 1975, the La Brea Tar Pits was attracting upwards of 400,000 visitors each year, and since the original dig, more than half a million specimens had been recovered.[125] Up until this point, however, the Museum of Natural History in Exposition Park still served as the principal location for viewing fossils (and for storage of the larger collection).

By this time, the County had held Hancock Park for over 50 years, but the original vision of constructing a museum for the paleontological finds of the La Brea Tar Pits had not come to fruition. While many plans for the park's museum facilities had come and gone, the only dedicated facility constructed for interpretive purposes remained the 1952 Observation Pit. In the mid-1970s, after more than half a century of active excavations, curation, and education, plans for a museum dedicated to the La Brea Tar Pits and its Pleistocene-era treasures finally moved forward in earnest.

The catalyst arrived in the form of a multi-million dollar donation from Los Angeles entrepreneur George C. Page. A self-made businessman and native of Nebraska, Page had moved to Los Angeles in ca. 1918, at the age of 16, with little in the way of resources or contacts.[126] Through the years, he eventually built a successful business; during his lean years, Page recalled that he frequented the many free tourist attractions that Los Angeles had to offer, including the La Brea Tar Pits. Reflecting on this time in 1990, Page recounted that he had been "fascinated by the puddles that had trapped saber-toothed cats, mastodons and other ancient animals," but at the same time "dismayed to learn that the only way he could see the fossilized bones was the travel seven miles to the Museum of Natural History in Exposition Park": "'What a pity they haven't been exhibited on the site where they were found,'" he later said.[127]

As with Hancock's gift in the 1920s, Page's gift to the County came with a key condition: that he hold an active (decisive) role in the selection process for an architect as well as for the museum design. Toward this end, Page is said to have rejected the proposals of five well-known architects and instead turned to two young, Pasadena-based architects, Willis E. Fagan and Franklin W. Thornton.[128] Consequently, using their own funds, the architects

> spent a month touring the museums of America, asking professionals what they would do differently if they could re-create their institutions. Finally, they came to Page with a proposal. 'You've taken [the fossils] out of the ground here,' the young architects said of the La Brea discoveries. 'Why don't we put them back in?'[129]

Their 1974 plans devised a method for doing this, with the concept of a burial mound-like form, partially below grade and integrated into the surrounding site through sloped berms, visually and physically preserving green space within Hancock Park. Atop the mound was a large platform with a Brutalist-style

[125] "County Will Get Tar Pits View Station," 21 December 1975, *Los Angeles Times*, ProQuest Historical Newspapers; "La Brea Museum Will Be Built Near Tar Pit Area," 20 April 1975, *Los Angeles Times*, ProQuest Historical Newspapers.

[126] Biederman, 1990.

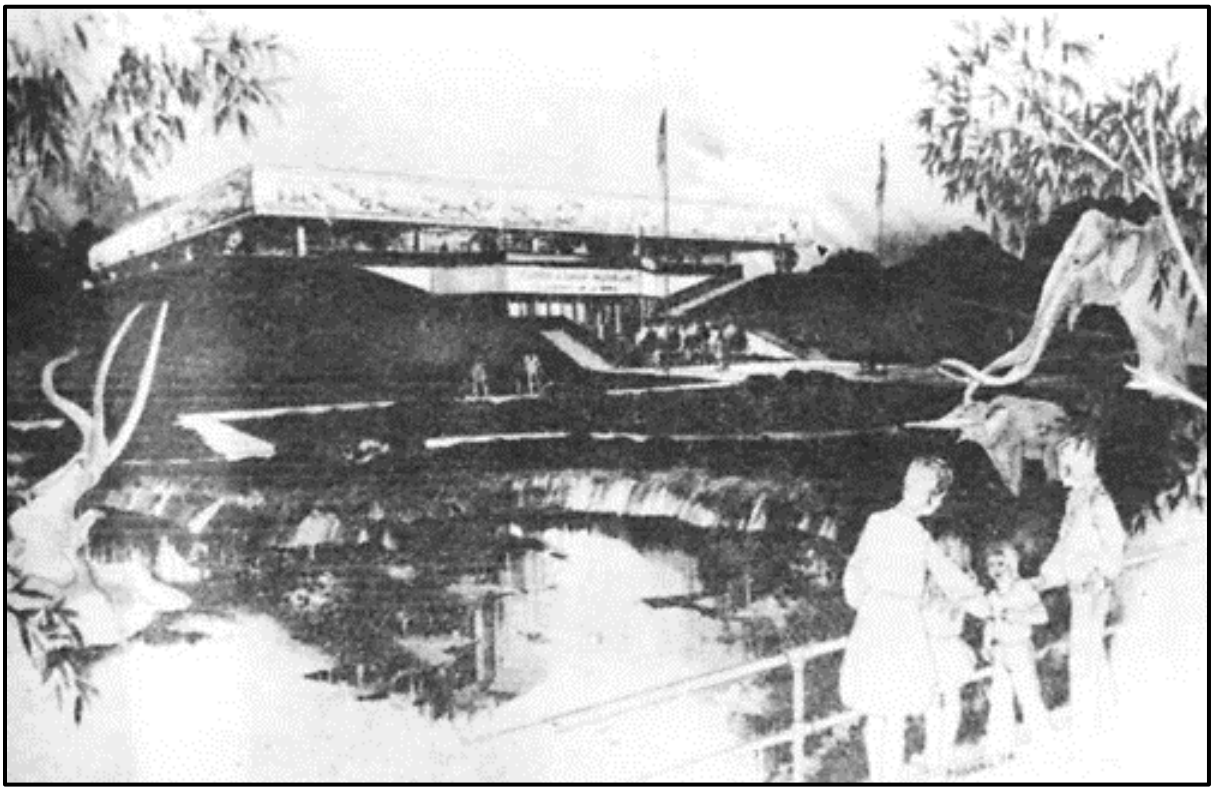
[127] Biederman, 1990.

[128] Biederman, 1990.

[129] Biederman, 1990.

pavilion structure defined by an expansive projecting frieze (Figure 45). The fiberglass frieze is intended to appear as carved stone with a continuous bas relief sculpture depicting scenes from the Pleistocene period, prepared by sculptor Manuel La Paz and supported by an exposed space frame roof structure.[130] Throughout the construction process, Page is said to have provided design guidance and overseen construction by operating out of a recreational vehicle-turned makeshift construction trailer on the site.[131]

Figure 45. Artistic rendering of the George C. Page Museum, La Brea Tar Pits, ca. 1975



Source: Park La Brea News, April 24, 1975

The metaphor of the burial mound was powerful in its symbolism of returning the fossils soon to be exhibited at the facility to a state of being underground, while also transporting the visitor to a different time period, ultimately creating an immersive experience. This was framed in the entrance progression into the building, which followed a formal and symmetrically composed descent into the museum, flanked by the surrounding berms and monumentality of the exposed building elements of the second floor. The interior atrium space and its collection of lush plantings also was intended to evoke the sense of a Pleistocene garden, transporting the visitor back in time.

The site selected for the new museum was located towards the northeast corner of Hancock Park, set between the existing surface parking lot to the north, the Lake Pit to the south, and Curson Avenue to the east. The area was largely defined by the large open field that dominated this portion of Hancock Park; a small comfort station building and walkway were also present at the location.[132] These features were demolished to allow for the construction of the museum (Figure 46).

[130] Dreyfuss, J. 1977. "George C. Page Museum: Trip Back in Time," *Los Angeles Times*, August 7, 1977.

[131] Oliver, M. 2000. "George C. Page; Philanthropist Founded La Brea Museum," *Los Angeles Times*, November 30, 2000, ProQuest Historical Newspapers.

[132] Willis, Fagan & Associates. 1975. "Survey and Demolition Plan" Sheet No. A-1 in the Original Drawing set for the George C. Page Discoveries of La Brea Museum, 5801 Wilshire Boulevard (February 18, 1975). On file with the Museums of Natural History of Los Angeles.

Ultimately, the museum's location in Hancock Park presented numerous challenges during construction. Located in the vicinity of the tar pits, both existing to the south and previously infilled to the north, the museum location rested on tar seeps with a shallow water table that created a difficult environment for below-grade construction. To account for this, project engineers developed a system wherein the museum would sit on a gas-proof rubber and nylon membrane, which would be sandwiched between a bed of sand and a working slab cap. A reinforced concrete slab was then constructed above these elements with the intention of creating a hull-like structure that would allow the building to "float" on the pressure related to the gases and liquids of the site.[133]

Figure 46. George C. Page Museum façade, 1978, southwest perspective

Source: Los Angeles Public Library

In the interior, the principal exhibit designer for the Page Museum was James H. Carmel, a faculty member at the Cranbrook Institute of Science. From 1939 to the 1970s (with an absence during his service in World War II), Carmel served as Preparator, Trustee, and Head of Exhibit Section at Cranbrook until accepting a position with the Page Museum, to help design the museum's exhibits.[134] In addition, exhibits were developed by consultants from universities, museums, and even Disneyland. The goal was developing new ways to present fossils and exhibits that would engage the visitor beyond the traditional interpretive programming.[135] Page was also cognizant of the size of the museum and extent of the exhibits, aiming to create an accessible and inviting environment. Along these lines, for example, more typically domestic materials, such as carpeted flooring, were selected for increased comfort.

Focal points of the museum—and features that continue to set the museum apart—are the exposed structure of the atrium ceiling, the open atrium with landscaping, and the working laboratory, framed with windows, through which visitors can view museum staff working (Figure 47). Among similar museums,

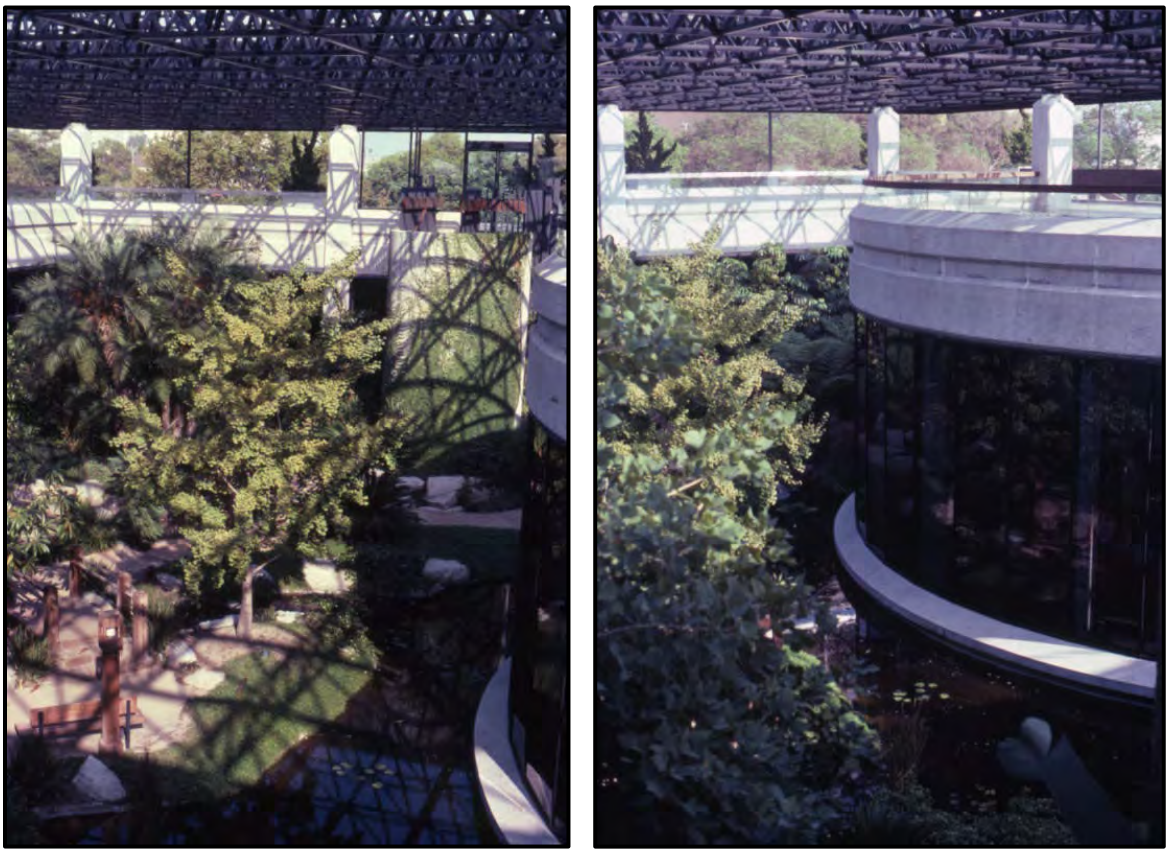
[133] Dreyfuss, 1977.

[134] "James H. Carmel, Curiosity and Wonder: Life at Cranbrook and Beyond," 11 May 2022, Cranbrook Kitchen Sink, Cranbrook Center for Collections and Research. Available at: http:// https://cranbrookkitchensink.com/tag/james-h-carmel/. Accessed 15 June 2022.

[135] Oliver, 2000.

the fishbowl feature is often cited as the first and only of its kind, with a working laboratory that is the site of scientific research and that serves the educational objective of the museum.[136]

Figure 47. Open atrium at center of Page Museum, ca. 1980



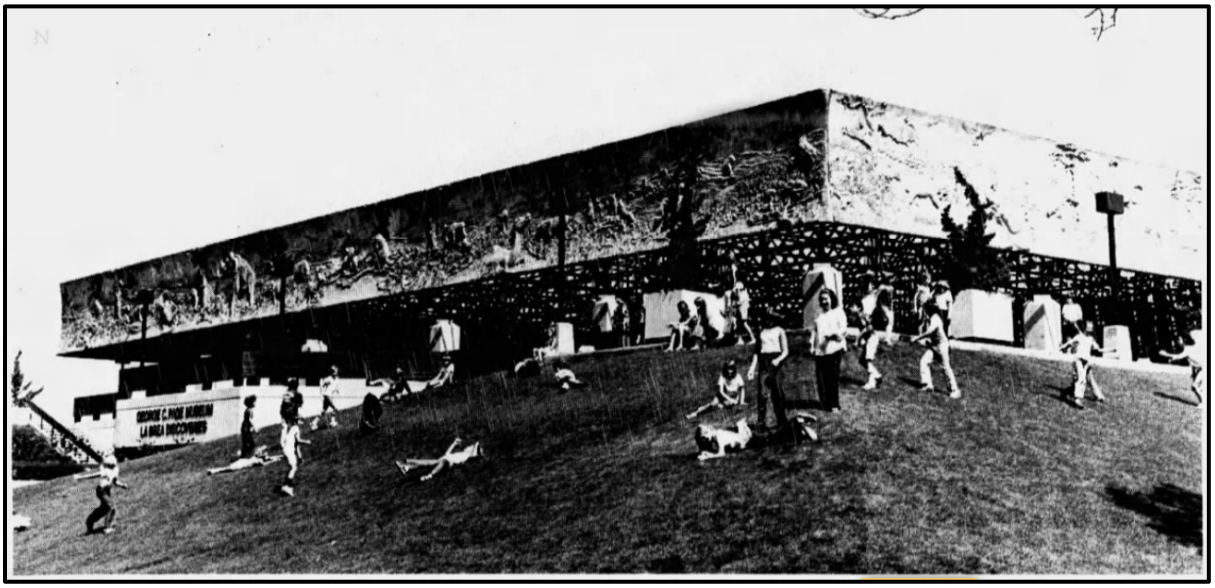
Source: Los Angeles Public Library

The museum was completed to great acclaim in 1977. It immediately became a celebrated, sought-after institution along Wilshire Boulevard's emerging Museum Row. The experiential qualities of the design—including its form and mass, the circular interior layout that created a natural progression through the exhibition spaces, and carefully curated and even interactive exhibits—all created a highly engaging space that did not overwhelm visitors.[137] The domestic scale and materials of the museum's interior made it informal and accessible to children and adults alike; the sharply raised berms circling the building also became a highlight as a feature that integrated the building into the broader landscape. The berms provided new spaces to congregate and vantage points for experiencing the park. The berms were adopted by many young visitors (across generations) as a quasi-play structure, where they could run and roll down the hill (Figure 48).

[136] Oliver, 2000; Biederman, 1990.

[137] Dreyfuss, 1977.

Figure 48. Hancock Park's Page Museum, with schoolchildren playing on berms



Source: Los Angeles Times, August 7, 1977

Since the Page Museum opened in 1977, changes have been relatively minimal. Aside from ongoing maintenance work and various improvements to interior spaces, fixtures, and finished, the building has largely retained its original design, particularly along the exterior and surrounding site, setting, and landscapes. The most notable changes include the installation of the two monumental statues flanking the primary entrance progression, replacement of the original wood guard rail along the second floor, and the installation of new handrails to the primary entrance ramps and flanking exterior stairways.

Architects | Thornton & Fagan Associates

The Page Museum was designed by the Pasadena-based architecture firm of Thornton & Fagan Associates. Founded by architects Franklin W. Thornton and Willis E. Fagan, Thornton & Fagan operated in the region from 1970 until 1980, completing a range of residential, commercial, and institutional commissions predominantly in Pasadena and the surrounding San Gabriel Valley.[138] Their most well-known building appears to have been the Page Museum, a commission awarded to them in 1975 through the efforts of George C. Page (as described above). Additional known and publicized works, all in Pasadena, include the Late Modern-style Pasadena Medical Arts Building (50 Bellefontaine Street), constructed in 1974; "Tara West," a 1978 Georgian Revival-style residence at 640 Oak Knoll Circle inspired by the plantation home in the film *Gone with the Wind*; and the Late Modern-style Bridge House at 819 Las Palmas Road, constructed in 1979.[139]

In 1980, Thornton & Fagan merged with the firm Urban Design Disciplines. The resulting firm was reorganized as Thornton, Fagan, Brant, and Rancourt, Inc. (TFBR), with the addition of principals Daniel L. Rancourt and Marilyn Brant, an architect and planner, respectively.[140] Thornton and Fagan also maintained a development company, founded in 1975 and known as Thornton & Fagan, Inc. Available records suggest that the development company focused on a mixture of residential and commercial developments in the Pasadena area and San Gabriel Valley communities. Projects included the Neo-Mediterranean Revival-style La Canada Crest Condominiums (2145 La Cañada Crest, La Cañada-

[138] "TFBR, New Architectural Firm, Opens in Pasadena," *Los Angeles Times*, May 4, 1980.

[139] "Four-Story Building Going Up in Pasadena," *Los Angeles Times*, March 24, 1974; Ryon, R., "Pasadena Home Copies Mansion of Famous Film," *Los Angeles Times*, July 2, 1978; Advertisement "Hot Property - 819 Las Palmas Road, Pasadena," *Los Angeles Times*, April 1, 2017.

[140] "TFBR, New Architectural Firm, Opens in Pasadena," *Los Angeles Times*, May 4, 1980.

Flintridge), constructed in 1980, and the Neo-Queen-Anne-style multi-family residential development of Page's Victorian Court (444 S. Los Robles Avenue, Pasadena).[141]

Franklin W. Thornton, AIA

Franklin Wilberforce Thornton was born in Los Angeles in 1934.[142] His father, Hugh Thornton, worked as a sales representative for Palos Verdes Estates in the 1920s, but by the 1940s had shifted to a career in landscape architecture.[143] Thornton grew up in the Los Angeles area and ultimately attended Pasadena City College, where he studied architecture and graduated in 1958.[144] Sources illuminating his early years of professional practice were not available; by 1970, he had formed a partnership with his colleague Willis E. Fagan, which would define his career over subsequent decades. Thornton eventually started his own architecture practice, in addition to his shared projects with Fagan. The extent of his solo work is largely undocumented, though some single-family residences in the late 1980s have been attributed to him.[145] Available sources suggest he continued to practice architecture into subsequent decades, primarily throughout the San Gabriel Valley.

Willis E. Fagan

Willis Endford Fagan was born in October 1938 in the city of Daloa in then-French West Africa (now Ivory Coast). His parents, Anne and Thomas Fagan, were missionaries from Northern Ireland and Canada, respectively, who had been living and working in Africa during the late 1930s and early 1940s. In 1942, the Fagans migrated to Canada and lived in the Toronto, Ontario, region before emigrating to the United States in 1948, where they settled in the San Gabriel Valley.[146] Fagan lived in the San Gabriel Valley throughout high school, ultimately graduating from Rosemead High School in 1956.[147]

By the early 1960s, Fagan was working as an architectural draftsman in the San Gabriel area.[148] In 1970, Fagan partnered with Frank Thornton to form Thornton & Fagan Associates, which they continued to operate over the following decade, in addition to their development company Thornton & Fagan, Inc. While scant available information has been identified on Fagan's career starting in the 1980s, sources suggest that he continued to practice architecture, working in the Pasadena-San Gabriel area. He remains most widely known for his work designing the Page Museum.

Architecture | Brutalism

Constructed in 1977, the Page Museum exhibits elements of the Modernist variation known as "Brutalism." This style was developed in Europe during the mid-twentieth century and popularized through the works of renowned Swiss architect Le Corbusier and British architects Alison and Peter Smithson. The term "Brutalism" is thought to have derived from the French phrase *beton brut*, meaning raw concrete, in reference to the use of unfinished concrete as the primary design feature, both in terms of articulation of forms and materiality. The reliance on unfinished concrete and the projection of structure

[141] "La Canada Crest Plans Month-Long Open House," *Monrovia-News Post*, October 5, 1980; Advertisement "Preview Opening – Page's Victorian Court," *Los Angeles Times*, August 2, 1980.

[142] Franklin Wilberforce Thornton in "California Birth Index, 1905-1995." Available at: https://www.ancestry.com/search/collections/5247/. Accessed April 27, 2022.

[143] "Palos Verdes Estates," *Los Angeles Evening Express*, February 27, 1926; Frank Thornton in "1940 U.S. Federal Census." Available at: https://www.ancestry.com. Accessed April 27, 2022.

[144] Franklin W. Thornton in "U.S., School Yearbooks, 1900-1999." Available at: https://www.ancestry.com. Accessed April 27, 2022.

[145] "Arcadia Manor Listed for $1.39 Million," *Los Angeles Times* February 24, 1990.

[146] Willis Endford Fagan in "U.S. Border Crossings from Canada to U.S., 1895-1960." Available at: https://www.ancestry.com. Accessed April 27, 2022.

[147] Willis Endford Fagan in "U.S., School Yearbooks, 1900-1999." Available at: https://www.ancestry.com. Accessed April 27, 2022.

[148] Records show that Fagan entered Canada in September 1956 and returned to the United States in May 1957, which corresponds with the school year calendar. While this suggests that Fagan may have enrolled in a drafting program in Canada during this period, no supporting evidence has been found at this time.

as ornamentation through strong geometric elements was intended to create a universal and honest architectural style.[149]

Developed as an architectural philosophy in the 1950s, the concept of Brutalism evolved into a more codified style during the 1960s as is it gained popularity in the United States. It represented a reaction to the minimalist and glazing-centric treatments of other Modernist architectural styles and was often combined with elements and architectural details of other emerging styles from the period, namely New Formalism, Expressionism, and Structuralism. This transitional nature of Brutalism as part of the broader Modern architectural movement, particularly in the 1960s, results in a variety of compositions that can range from more traditional/classical and symmetrical forms to more futuristic and irregular designs. The unifying aspects found in Brutalism include strong tectonic, angular, and sculptural forms expressed through exposed concrete throughout, which in turn lends to a monumentality and heaviness that was seen as a direct reaction to the light and airy qualities of other Modern styles. These bulky and proportionally exaggerated compositional qualities translated into a perceived permanence, which was appealing in the design for several civic, institutional, and commercial buildings during this period.[150]

Significant examples of Brutalist civic and institutional buildings in the Los Angeles area include:

- **Glendale Municipal Services Building** (633 E. Broadway, Glendale), A.C. Martin & Associates and Merril W. Baird, 1966
- **St. Basil Catholic Church** (3611 Wilshire Boulevard, Los Angeles), A.C. Martin & Associates, 1969
- **Glendale Central Library** (222 E. Harvard Street, Glendale), Welton Becket & Associates, 1973
- **Inglewood Civic Center** (1 Manchester Boulevard, Inglewood), Charles Luckman Associates and Robert Herrick Carter, 1973
- **Braille Institute of America** (741 N. Vermont Avenue, Los Angeles), William L. Pereira & Associates, 1975
- **Japanese American Community and Cultural Center** (244 S. San Pedro Street, Los Angeles), Kazumi Adachi, Kiyoski Swano, and Hideo Matsunaga, 1978 to 1983

Overview of Construction Chronology

This section provides a general construction chronology for Hancock Park and the La Brea Tar Pits complex and facilities, focusing on significant construction activities and master planning efforts directly preceding and ever since the property's donation to the County of Los Angeles. This section provides a concise summary of the construction history provided in Section 5 (Historic Setting and Context).

Table 3 below describes the highlights in the construction chronology of Hancock Park and the La Brea Tar Pits. Following the timeline, a visual overview of the site's history is provided in a series of historic aerial photographs, in Figure 49 through Figure 55.

[149] Paul, D. *SurveyLA Los Angeles Historic Resources Survey - Citywide Historic Context Statement, Architecture and Engineering 1850-1980, LA. Modernism 1919-1980, Late Modern 1966-1990*, pp. 26-27. Prepared for the City of Los Angeles, Department of City Planning, Office of Historic Resources.

[150] Paul, pp. 27-28.

Table 3. Timeline of Construction at Hancock Park and La Brea Tar Pits

DATE	EVENT
1828:	Provisional land grant Rancho La Brea given to Antonio Jose Rocha
1850s:	Rancho La Brea purchased by brothers John and Major Henry Hancock. Henry and wife Ida later construct a ranch home on the banks of the Lake Pit at an unknown date
1860s-1880s:	Hancock excavates "brea" tar material from the property, marking the beginning of the various tar pits throughout the property
1883:	Major Hancock passes away, and Rancho La Brea is transferred to his wife and children
1900s:	Ida Hancock leases a portion of Rancho La Brea to the Salt Lake Oil Company for oil exploration; the company in turn develops the Salt Lake Oil Fields The Hancocks establish their own oil venture, the Rancho La Brea Oil Company, and begin producing oil, amassing a vast fortune in the process
1901:	Oil exploration and geological studies result in some of the earliest discoveries of prehistoric fossils on the site, prompting multiple excavations in subsequent years
1913-1915:	Hancock family grants exclusive rights to excavate fossils at Rancho La Brea to the Los Angeles County Museum of History, Science, and Art, which creates over 100 pits over a two-year time frame G. Allan Hancock begins coordinating with the County to donate the land around the tar pits following the completion of the excavations
1916:	Hancock announces first official donation of 32-acres of land to the County Paul G. Thiene and Lloyd Wright plan for Hancock Park released, which includes an Olmstedian-like design with areas of Beaux-Arts formalism; plans are not implemented, though negotiations continue
1923:	Negotiations for Hancock's donated land, now comprising 25 acres, are finalized
1924:	Donation of Hancock Park to the County is made official County announces initial site improvements
1926:	Revised plan for "Pleistocene Park" released Plan similar to 1916 Thiene and Wright design, with meandering pathways, central lawns, preservation of oil lakes, expanded excavation pits, and prominent entrances at Wilshire Boulevard "Pleistocene Park" also includes plans for a museum on the banks of the Lake Pit, with an ornamental footbridge connecting the museum to Wilshire Boulevard
1928:	Perimeter plantings and footpaths for entry to the park are installed
Ca.1930:	Stone walls installed around open excavation pits, and stone foot bridge added Spanish Colonial Revival-style groundskeeper residence, operations building, and service yard constructed at the easter perimeter of the park
1938:	New comfort stations, drainage and water conveyance systems, and repairs to the stone masonry walls and footbridge constructed
1940:	New plans for Hancock Park issued, which includes a prominent, circular pathway and radiating, meandering networks throughout the park The 1940 plan was not ultimately implemented
1948:	Harry Sims Bent hired as architect and planner for a new, multi-year Hancock Park Master Plan

DATE	EVENT
1947-1952:	Master Plan Phase 1 commences, with site upgrades, new comfort stations, improved water conveyance, restored streambed, new circulation pathways
1952:	Master Plan Phase 1 concludes, culminating in addition of Observation Pit
1958:	Celebrated landscape architect Ralph Cornell hired to develop plan for Hancock Park, which would include museum north of Lake Pit. While plans are not implemented, they inform future studies and design development
1959:	Potential plans for a new fine arts complex in Hancock Park (which will become LACMA) considered in feasibility study
1961:	William L. Pereira & Associates hired to develop a campus plan and design for LACMA, Hancock Park, and a La Brea Tar Pits museum
1962:	The eastern portion of Hancock Park is redeveloped Alterations include construction the surface parking lot in the northeast corner of the site, chain-link security fencing around excavation pits and Lake Pit, new comfort station and pathways around Lake Pit
1964:	LACMA completed and opened to the public
1967:	New plan developed for Hancock Park and La Brea Tar Pits complex, focused on re-envisioning the eastern portion of the park Plans include addition of statuary of Pleistocene animals at select locations throughout the park, including along the banks of the Lake Pit
1969:	New excavations begin in the center of the park (which continue to the present day) Support facilities added include shafts, buildings, and sheds for excavation operations, security fencing, and temporary and permanent shade structures
1974:	Plans announced for a new La Brea Tar Pits Museum Donor George C. Page selects Thornton, Fagan & Associates as project architect
1975:	Construction on the George C. Page Museum commences
1977:	George C. Page Museum is completed and opens to the public Related site-design changes include new network of pathways fanning out from new axial entrance at park's southeast corner, as well as a new plaza northeast of Lake Pit
1980s:	Additions and reconfigurations at the rear of LACMA results in reconfiguration of the concentric pathways surrounding Observation Pit
1989:	LACMA's Pavilion for Japanese Art opens northwest of Lake Pit
1994:	Hancock Park Master Plan prepared by Hann/Olin completed, outlining proposed changes to Hancock Park and the La Brea Tar Pits Museum and Grounds
1999:	Redevelopment of Hancock Park landscape concludes, with upgrades including reconfiguration of pathways, addition of comfort stations, amphitheater and seat wall installation in park's northwest quadrant, picnic area, reconfiguration of statues, stream restoration, 60,000 plantings, reconfiguration of Page Museum entry plaza, removal of the Lake Pit observation deck, and redevelopment of southwest entrance to Hancock Park, with circular entrance plaza
2014:	Observation Pit refurbished and reopened to the public Site improvements completed during this time include new wayfinding and interpretive signage, upgrades to 1999 comfort station, new security fencing, and reconfiguration of excavation site at Project 23 to create a more pleasant and cohesive aesthetic for Hancock Park

DATE	EVENT
2019:	Plans to redevelop the La Brea Tar Pits Museum and Grounds announced to the public
2020:	Demolition of the original LACMA complex commences for construction of a new LACMA building

Figure 49. Project site, 1928; showing Lake Pit, perimeter trees, and diagonal entry path in northwest corner, which led to Hancock ranch house northeast of Lake Pit (and extant as of 1928)

Source: Environmental Data Research, 2022

Figure 50. Project site, 1938; shows perimeter trees and diagonal entry path in northeast corner leading to Hancock ranch house

Source: Environmental Data Resources, 2022

Figure 51. Project site, 1956; as of 1956, Hancock residence had been removed, perimeter trees were mature, diagonal entry path intact and extended along northern expanse of the Lake Pit, and northeast parking lot and adjacent pathways (which are extant) had been added

Source: Environmental Data Resources, 2022

Figure 52. Project site, 1971; LACMA now occupies southwestern quadrant of Hancock Park

Source: Environmental Data Resources, 2022

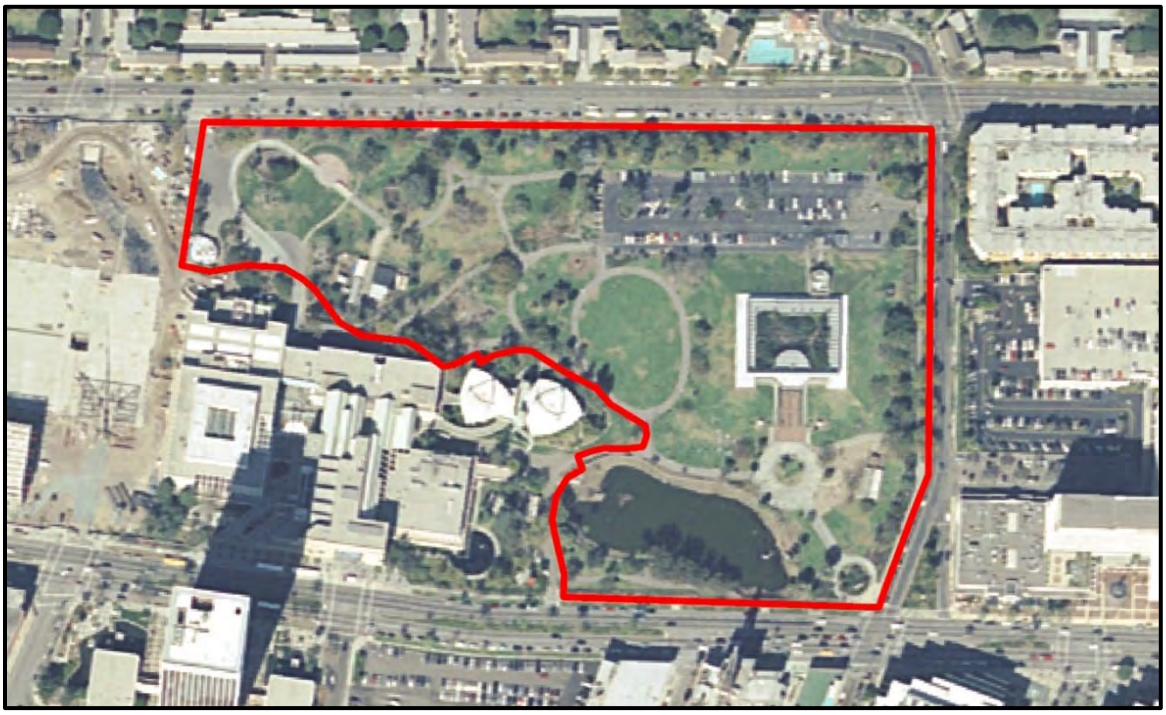
Figure 53. Project site, 1977; the Page Museum opens in 1977, realizing a 50+-year-old goal for the La Brea Tar Pits complex; the Page's orthogonal, pyramidal site reads clearly in this aerial photo

Source: Environmental Data Resources, 2022

Figure 54. Project site, 1994; the Pavilion for Japanese Art is now adjacent, to the west, to Lake Pit

Source: Environmental Data Resources, 2022

Figure 55. Project site, 2007; shows master plan enhancements from late 1990s, most notably in northwestern quadrant, as well as the truncation of Hancock Park at northwest border with LACMA; Observation Pit now marks the western boundary of La Brea Tar Pits complex



Source: Environmental Data Resources, 2022

6. HISTORIC RESOURCES SURVEY AND RESULTS

This section provides an overview of previously identified historic resources and of the results of a field survey of properties within the CEQA Area of Potential Effects (APE). For purposes of this study, the CEQA APE encompasses the project site and all directly adjacent or facing parcels.

Previously Identified Historic Resources

Within the CEQA APE, 11 properties have been previously identified as historical resources pursuant to CEQA (Table 4). All 11 resources were identified through the City of Los Angeles citywide survey undertaking, SurveyLA; corresponding SurveyLA reports are cited throughout this section. None of these properties are included on the County of Los Angeles's Historical Landmark Registry.

Table 4. Previously Identified Historic Resources within CEQA APE

Address(es) / Assessor's Parcel Number	Property/Building Name | Inside or Outside Project Footprint	Built Date	CHR Status Code (Eval Source)
5801 Wilshire Boulevard (5508-016-902) (5905 Wilshire Boulevard in parcel data)	La Brea Tar Pits Historic District (inside project footprint)	Various	3S (SurveyLA)
5801 Wilshire Boulevard (5508-016-902) (5905 Wilshire Boulevard in parcel data)	George C. Page Museum (inside project footprint)	1977	3S (SurveyLA)
5801 Wilshire Boulevard (5508-016-902) (5905 Wilshire Boulevard in parcel data)	Hancock Park, Observation Pit (inside project footprint)	1952	3S (SurveyLA)
5905 Wilshire Boulevard (5508-016-902)	Pavilion for Japanese Art (outside project footprint)	1982–1988	3S (SurveyLA)
3rd Street (north), Hauser Boulevard (east), 6th Street (south), Fairfax Avenue (west)	Park La Brea Garden Apartments Historic District (outside project footprint)	1943 and 1951	3S (SurveyLA)
5757 W. Wilshire Boulevard (5508-015-009)	Prudential Square (outside project footprint)	1948	3S (SurveyLA)
5814 W. Wilshire Boulevard (5089-008-031) (5816 & 5818 W. Wilshire Boulevard)	Craft and Folk Art Museum (outside project footprint)	1930	3CS (SurveyLA)
5820 W. Wilshire Boulevard (5089-010-002)	Hancock Park Building (outside project footprint)	1958	3CS (SurveyLA)
5828 W. Wilshire Boulevard (5089-010-001) (710 S. Stanley Avenue, 5826 W. Wilshire Boulevard)	CMAY Gallery (formerly Arthur Murray Dance Studio) (outside project footprint)	1941	3S (SurveyLA)
5850 W. Wilshire Boulevard (5089-011-002) (5856 & 5858 W. Wilshire Boulevard)	Office Building (outside project footprint)	1951	3CS (SurveyLA)

KEY
3S—Appears eligible for National Register as an individual property through survey evaluation
3CS—Appears eligible for California Register as an individual property through survey evaluation

In addition, the records search of the California Historical Resources Information System (CHRIS) identified three previously recorded cultural resources: LAN-159 (P-19-000159; an archaeological site containing Native American-affiliated artifacts, in the northwest portion of the project site), LAN-1261H (P-19-001261; a historic-period refuse component associated with 1860s asphalt mining, located north of the lake pit); and P-19-171007 (Hancock Park-La Brea District, California Historical Landmark No. 170, determined NRHP-eligible under Criterion A; scientific contribution of fossils and the study of paleontology).

Evaluation of Properties in CEQA APE

Field surveys and research were conducted to field check previous findings and to identify and research of-age, previously unevaluated properties within the CEQA APE. Table 5 summarizes the results of these efforts and Figure 56 present a visual overview of historical resources within the CEQA APE.

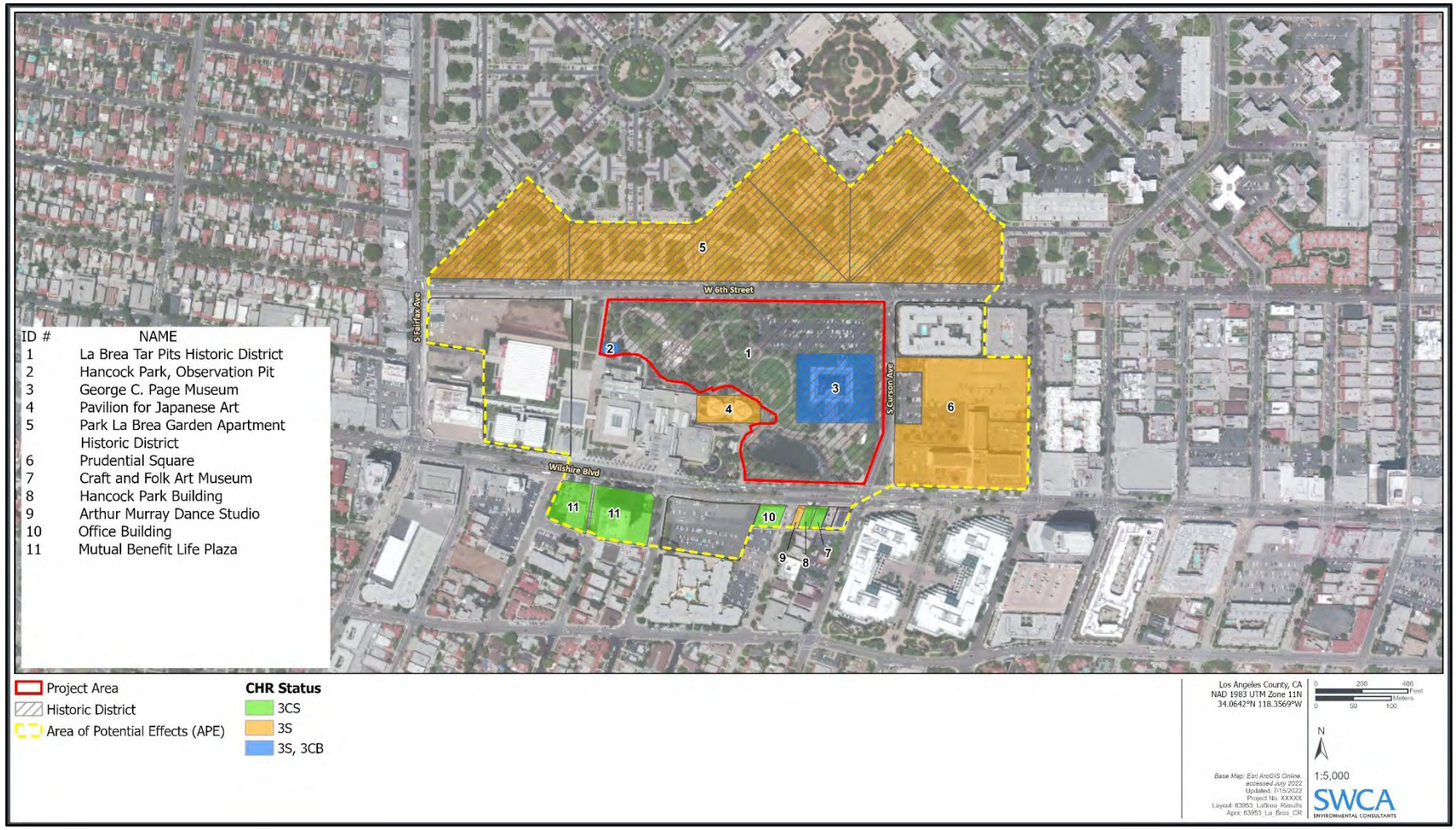
Table 5. Field Survey Results

#	Address(es) / Assessor's Parcel Number	Property/Building Name | Inside or Outside Project Footprint	Built Date	Historical Resource? (CHR Status)
1	5801 Wilshire Boulevard (5508-016-902) Recorded in County parcel data as 5905 Wilshire Boulevard	La Brea Tar Pits Historic District (inside project footprint); previously recorded as P-19-171007 (Hancock Park-La Brea District, California Historical Landmark No. 170, determined NRHP-eligible Criterion A; scientific contribution of fossils and the study of paleontology)	Various	Yes | 3CS
2	5801 Wilshire Boulevard (5508-016-902) Recorded in County parcel data as 5905 Wilshire Boulevard	George C. Page Museum (inside project footprint)	1977	Yes | 3S; 3CB
3	5801 Wilshire Boulevard (5508-016-902) Recorded in County parcel data as 5905 Wilshire Boulevard	Observation Pit (inside project footprint)	1952	Yes | 3S; 3CB
4	5905 Wilshire Boulevard (5508-016-902) Eastern segment of LACMA, same address but separate parcel	Pavilion for Japanese Art (outside project footprint)	1982–1988	Yes | 3S
5	555 S. Ogden Drive/5509-004-013 (1943) 5900 Lindenhurst Avenue/5509-004-010 (1943) 530 Alandele Avenue/5509-004-007 (1943) 501 S. Fuller Avenue/5509-004-006 (1943) 5721 W. 6th Street/5509-004-004 (1943)	Park La Brea Garden Apartment Historic District (outside project footprint) District bounded by 3rd Street (north), Hauser Boulevard (east), 6th Street (south), Fairfax Avenue (west).	1943 and 1951	Yes | 3S
6	600 S. Curson Avenue (5508-015-006)	"Museum Terrace" Apartments (outside project footprint)	1986	No | 6Z (1)
7	640 S. Curson Avenue (5508-015-008)	"One Museum Square" Apartments (outside project footprint)	2021	No | 6Z (1)
8	5757 W. Wilshire Boulevard (5508-015-009)	Prudential Square (outside project footprint)	1948	Yes | 3S
9	5800 W. Wilshire Boulevard (5089-010-005)	Office building (outside project footprint)	1958	No | 6Z (2)
10	5814 W. Wilshire Boulevard (5089-010-003)	Craft and Folk Art Museum (outside project footprint)	1930	Yes | 3CS
11	5820 W. Wilshire Boulevard (5089-010-002)	Hancock Park Building (outside project footprint)	1958	Yes | 3CS
12	5828 W. Wilshire Boulevard (5089-010-001) (710 S. Stanley Avenue, 5826 W. Wilshire Boulevard)	CMAY Gallery (formerly Arthur Murray Dance Studio (outside project footprint)	1947 (LA Co Tax Assessor)	Yes | 3S
13	5850 W. Wilshire Boulevard (5089-011-002) (5856 and 5858 W. Wilshire Boulevard)	Office Building (outside project footprint)	1951	Yes | 3CS
14	APN 5089-011-154	Vacant land	N/A	N/A
15	5900 Wilshire Boulevard (5086-021-038) Oversized parcel extends to S. Ogden Drive; includes the following addresses: 5950 W. Wilshire Boulevard; 714–716 and 717–719 S. Genesee Avenue; and 5904–5950 W. Wilshire Boulevard	Mutual Benefit Life Plaza (outside project footprint)	1969–1971	Yes | 3CS

#	Address(es) / Assessor's Parcel Number	Property/Building Name | Inside or Outside Project Footprint	Built Date	Historical Resource? (CHR Status)
16	5905 Wilshire Boulevard (5508-017-009); western segment of LACMA, same address as eastern segment, different APN	Los Angeles County Museum of Art (outside project footprint)	Various	No (new museum under construction)

KEY
3B— Appears eligible for NR both individually and as a contributor to an NR eligible district through survey evaluation
3S—Appears eligible for NR as an individual property through survey evaluation
3CB— Appears eligible for CR both individually and as a contributor to a CR eligible district through survey evaluation
3CS—Appears eligible for California Register as an individual property through survey evaluation
6Z (1)—Less than 50 years old and not of exceptional significance
6Z (2)—More than 50 years old but lacks historical integrity

Figure 56. Field survey results



Properties within Project Footprint

The following sections provide information on each of the properties within the CEQA APE, beginning with the project site, then progressing from north, east, south, and west through the area of potential indirect effects (i.e., the adjacent and facing parcels). Character-defining features for the historical resources within the project footprint are included.

1. LA BREA TAR PITS HISTORIC DISTRICT | 5801 WILSHIRE BOULEVARD CHR STATUS CODE: 3CS

Based on research and site visits completed for this study, the La Brea Tar Pits Historic District **appears eligible for landmark designation at the state, county, and city levels.** The district was previously recorded as P-19-171007 (Hancock Park-La Brea District, California Historical Landmark No. 170, determined NRHP-eligible Criterion A; scientific contribution of fossils and the study of paleontology). The district meets Criteria 1/1/1 as a unique, significant collection of resources and related cultural institutions and facilities specifically designed to recover, curate, and display those resources to the public, in an example of cultural/institutional development in Los Angeles extending back nearly a century.

Due to its eligibility for the CRHR and for local county and city listing, the La Brea Tar Pits Historic District is **a historical resource for purposes of CEQA**.

The La Brea Tar Pits Historic District consists of related cultural/paleontological resources, site/landscape features, and institutional facilities reflecting the story of over 100 years of scientific excavation, study, public education, and exhibition of one of the world's most significant concentrations of Pleistocene-age fossils.

Located on Wilshire Boulevard's Miracle Mile, the historic district is bounded by Wilshire, Curson Avenue, 6th Street, and the adjacent Los Angeles County Museum of Art complex and Japanese Pavilion. Excluding these two museums, the historic district boundaries correspond to those of Hancock Park. While Hancock Park itself, in terms of its topography, circulation corridors, and landscaping, has changed over time (with significant changes completed in the 1990s, as noted in Section 5), the extant contributing elements of this cultural landscape are intact and convey the historic district's significance.

In 2014/2015, the La Brea Tar Pits complex was found eligible as a historic district for the NRHP, CRHR, and for local listing through SurveyLA. The property was found to be eligible for listing in the NRHP and CRHR, as well as designation as a Los Angeles HCM under Criteria A, 1, and A, respectively with significance under two contexts. The reasons for significance for each were described in the following manner: the district was found to be a historical resource as an "excellent and extremely rare example of an intact archaeological and paleontological district in a densely developed urban area," and for its "association with the development of county-owned cultural institutions along Miracle Mile in Los Angeles."[151]

Due to recent changes to the site's topography, pathways, and landscaping, in particular through the northwestern quadrant of the park, however, the district does not appear eligible for the NRHP.
The period of significance begins in the Pleistocene era and ends in 1977; this end date marks the culmination of over 50 years of effort to build a dedicated museum within the La Brea Tar Pits complex. In 1977, the Page Museum opened to display the paleontological resources on the site of their discovery.

[151] Architectural Resources Group. 2015. Appendix C: Historic Districts and Planning Districts. In *Survey LA Historic Resources Survey Report – Wilshire Community Plan Area*, p. 958. Prepared for City of Los Angeles Office of Historic Resources.

Fossils and interpretive exhibits had previously, primarily, been exhibited at the Natural History Museum in Exposition Park.

(Character-defining features of the Page Museum and Observation Pit, which are individually eligible, are described below.)

In spite of alterations to the park overall, the rarity and significance of the site's paleontological resources and the buildings constructed to facilitate their active study and exhibition reflect a history of institutional and cultural development in Los Angeles (if not the entire United States) that is unique.

Table 6 provides a visual overview of each character-defining feature, along with its era/date of construction. The historic district's character-defining features include but may not be limited to these components.

Table 6. Character-Defining Features and Components, La Brea Tar Pits Historic District

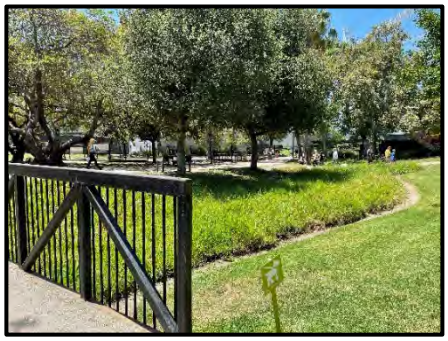
Photo	Character-Defining / Contributing Feature	Era / Date of Construction
	Lake Pit	Lake pit excavated in 19th century
	Excavation pits	Resources dating to Pleistocene era; facilities through present day
	Oil Creek	Topographic feature

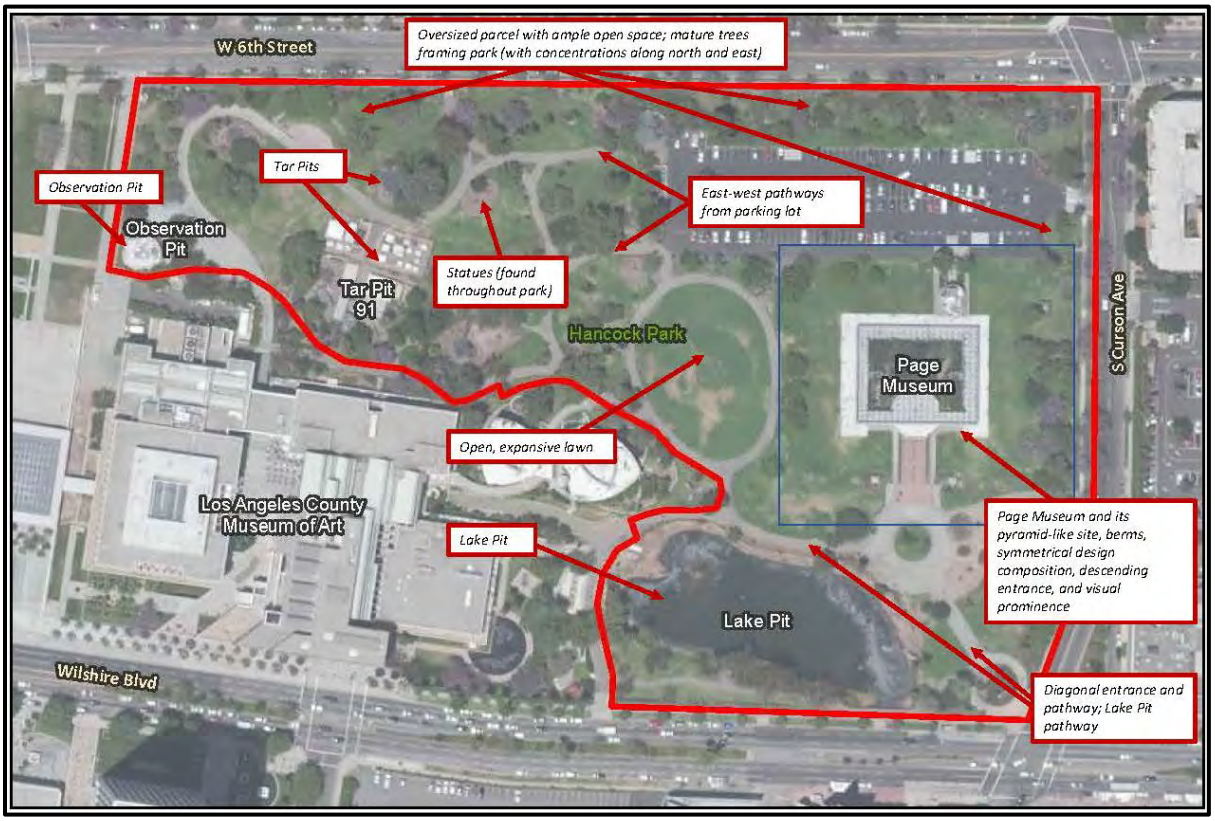
Photo	Character-Defining / Contributing Feature	Era / Date of Construction
	Oversized parcel with significant amount of open space	Circa 1910s through present day; by the 1920s, the site's contrast with surrounding areas, which were being subdivided and developed, had become obvious. This contrast intensified with commercial development on Wilshire spearheaded by Ross and became pronounced with the completion of Metropolitan Life's Park La Brea complex.
	Perimeter trees and other mature trees within the park	Circa 1920s through 1977
	Southeast corner entrance from Wilshire Boulevard	Circa 1920s
	Remnant stone walls (Pit 9 and 13); these walls are assumed to date to the 1930s addition of stone walls encircling pit sites throughout the northwestern quadrant of the park	1930s

Photo	Character-Defining / Contributing Feature	Era / Date of Construction
	Observation Pit	1952
	Statuary depicting prehistoric animals	Various
	G. Allan Hancock memorial, placed in 1963 (east of Japanese Pavilion, north of Lake Pit)	1963
	Page Museum	1977

Photo	Character-Defining / Contributing Feature	Era / Date of Construction
	Page Museum topography, including berm	1977
	Circulation corridors and pathways (i.e., diagonal entry path, path adjacent to the Lake Pit, and pathways in north-central portion of the park flanked with mature trees	1920s through 1970s
	Overall spatial relationships between buildings, structures, open space, park/recreational areas, resources, and natural features	Various

Figure 57 presents an overview of the district's primary contributing features, followed by a series of photographs illustrating some of these features (Figure 57 through Figure 59).

Figure 57. Overview of La Brea Tar Pits Historic District, contributing features



Source: SWCA, 2022

Figure 58. Overview of La Brea Tar Pits Historic District, Page Museum, with pyramid-like site, berms, and adjacent lawn (top) and Lake Pit (bottom)

Source: SWCA, 2022

Figure 59. Overview of La Brea Tar Pits Historic District, active dig sites (Pits 3, 4, 61/67) (top) and mature trees framing park, concentrated along northern and eastern borders of park (bottom)

Source: SWCA, 2022

2. PAGE MUSEUM, LA BREA TAR PITS | 5801 WILSHIRE BOULEVARD CHR STATUS CODE: 3S

In 2015, the 1977 Page Museum was identified as eligible for inclusion in the NRHP and CRHR and for designation as a local HCM as part of SurveyLA. The building was documented as an "excellent example of Late Modern institutional architecture, designed by local architecture firm Thornton and Fagan."[152] The building is noted for having exceptional architectural significance and was determined eligible for the NRHP under Criterion C and using Criteria Consideration G ("Properties that Have Achieved Significance within the Past 50 Years"). The survey also found the Page Museum eligible for the CRHR and as a local HCM under Criteria 3/3, respectively.

The building has not changed significantly since it was documented and evaluated as part of the 2015 survey; this study carries forward the finding of NRHP, CRHR, and local HCM eligibility for the Page Museum. In addition, the property appears eligible under County Criterion 3. Therefore, the property qualifies as **a historical resource for purposes of CEQA**.

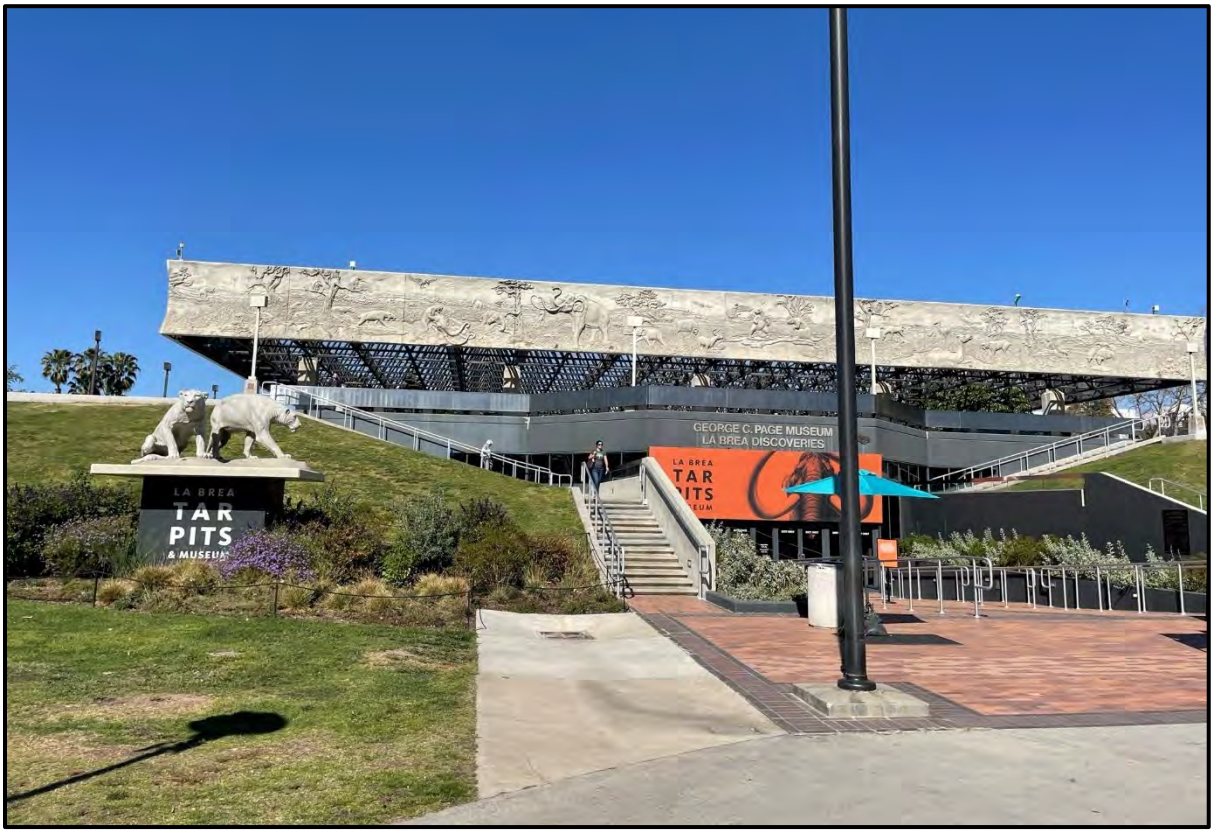
The primary character-defining features of the Page Museum include (but are not necessarily limited to):

- "Burial mound" berm/ pyramidal massing of the building and site
- Expansive adjacent lawn on the west
- Prominent fiberglass frieze with bas relief Pleistocene scenes and pronounced overhangs
- Structural space frame that supports the frieze and seems to float above podium level
- High degree of indoor-outdoor integration
- Open-air configuration at the podium level, with fiberglass frieze opening onto the central atrium
- Open, central atrium space with landscaping
- Symmetrical design composition, of the building and its site
- Sloped berms with turf plantings integrated into the exterior wall of the museum's ground floor
- Descending entrance on south, flanked by stairways leading to upper podium at the second-floor
- Laboratory space open to public view (interior)

Figure 60 through Figure 64 present current (2022) views of the Page Museum.

[152] Architectural Resources Group. 2015. Appendix A: Individual Resources. In *Survey LA Historic Resources Survey Report – Wilshire Community Plan Area*, p. 164. Prepared for the City of Los Angeles Office of Historic Resources.

Figure 60. Principal (south-facing) entrance to Page Museum, southeast perspective (top) and south perspective (bottom)



Source: SWCA, 2022

Figure 61. Page Museum, elevated berm and lawn (top) and frieze, open roof/podium, and interior atrium (bottom)

Source: SWCA, 2022

Figure 62. Page Museum and berm, northeast elevation

Source: SWCA, 2022

Figure 63. Page Museum podium and berm, west elevation

Source: SWCA, 2022

Figure 64. Open-air atrium, with landscaping, in center of Page Museum

Source: SWCA, 2022

3. OBSERVATION PIT, LA BREA TAR PITS | 5801 WILSHIRE BOULEVARD CHR STATUS CODE: 3S

In 2015, the Observation Pit was documented in SurveyLA as an "excellent example of Mid-Century Modern institutional architecture, designed by notable local architect Harry Sims Bent."[153] The 1952 building was determined eligible for listing in the NRHP and CRHR, and for local HCM designation under Criteria C/3/3, respectively.

The building has not changed significantly since it was documented and evaluated as part of the 2015 survey; this study carries forward the finding of NRHP, CRHR, and local HCM eligibility for the Observation Pit (Figure 65). In addition, the property appears eligible under County Criterion 3. Therefore, the Observation Pit **qualifies as a historical resource for purposes of CEQA**.

The primary character-defining features of the Observation Pit include (but are not necessarily limited to):

- Circular layout;
- One-story, horizontal and cylindrical massing;
- Flat roof profile with circular skylight openings and irregular parapet;
- Brick masonry as the primary material, both at the exterior and interior;
- Deeply recessed open-air entrance with low-profile canopy integrated into the roof profile;
- Band of window openings along the southern portion of the cylindrical façade;
- Pronounced cylindrical support columns with brick masonry veneer;
- Below-grade organization of the interior space;
- Full-height, cylindrical open interior volume at the center of the building framing the exposed excavation pit and fossils;
- Pedestrian stairs and observation platforms along the perimeter of the interior with metal guard rails; and
- Park setting and surrounding landscape.

[153] Architectural Resources Group, 2015, Appendix A, p. 163.

Figure 65. Observation Pit, main entrance (top) and interior (bottom); proposed project does not include changes to this building

Source: SWCA, 2022

Properties outside Project Footprint, within CEQA APE

This section provides information on properties outside the project footprint but within the CEQA APE.

1. PAVILION FOR JAPANESE ART, LACMA | 5905 WILSHIRE BOULEVARD | CHR STATUS CODE: 3S

In 2015, the Pavilion for Japanese Art, built in 1988, was identified as a historical resource eligible for listing in the NRHP and CRHR and for designation as a local HCM as part of SurveyLA. The building was found eligible as an "[e]xcellent example of an Organic style institutional building, designed by notable architect Bruce Goff and completed by notable architect Bart Prince."[154] Goff's arresting and expressionistic design incorporates folded panel walls suggestive of tatami mats and a roof superstructure reminiscent of Japanese basketry. The building is noted for having exceptional architectural significance and was determined eligible for NRHP listing under Criterion C and using Criteria Consideration G "Properties that Have Achieved Significance within the Past 50 Years"). The survey also found the Late Modern-style Pavilion for Japanese Art eligible for the CRHR and as a local HCM under Criteria 3/3, respectively. The building has not changed significantly since it was evaluated in 2015; this study carries forward the finding of NRHP, CRHR, and local HCM eligibility for the Pavilion for Japanese Art (Figure 66). In addition, the property appears eligible under County Criterion 3. The building is therefore **considered to be a historical resource for purposes of CEQA**.

Figure 66. Pavilion for Japanese Art, rear elevation (front elevation currently not accessible due to LACMA construction)

Source: SWCA, 2022

[154] Architectural Resources Group, 2015, Appendix A, p. 164.

2. PARK LA BREA GARDEN APARTMENT HISTORIC DISTRICT | CHR STATUS CODE: 3S

In 2015, as part of SurveyLA, Park La Brea Garden Apartment Historic District was identified as a historical resource eligible for the NRHP, CRHR, and as a local HPOZ under criteria C/3/3 as "an excellent example of a 1940s–1950s garden apartment complex in the area, unique in Los Angeles for its inclusion of high-rise as well as low-rise multi-family residential buildings."[155]

The district was found eligible under the context of Residential Development and Suburbanization, 1850–1980, subcontext of Multi-Family Residential Development 1910–1980, theme of Multi-Family Residential, 1910–1980, and the property type residential multi-family/garden apartment complex.

The district was designed by Leonard Schultze & Associates with Earl T. Heitschmidt. Park La Brea's buildings are "arranged in an innovative radial plan, with intersecting interior streets converging on circular landscaped areas. The two-story buildings are largely U-shaped, surrounding landscaped courtyards, and are in a Modern interpretation of the American Colonial Revival style. …There are no apparent alterations."[156]

The Park La Brea Garden Apartment Historic District is bounded by 3rd Street (north), Hauser Boulevard (east), 6th Street (south), and Fairfax Avenue (west). The parcels directly facing the project site across W. 6th Street, and therefore within the APE, are: 1) 555 S. Ogden Drive/5509-004-013 (1943); 2) 5900 Lindenhurst Avenue/5509-004-010 (1943); 3) 530 Alandele Avenue/5509-004-007 (1943); 4) 501 S. Fuller Avenue/5509-004-006 (1943); and 5) 5721 W. 6th Street/5509-004-004 (1943).

The buildings within the CEQA APE have not changed significantly since they were documented as part of the 2015 survey (Figure 67 and Figure 68); this study carries forward the finding of NRHP, CRHR, and local HPOZ eligibility for the Park La Brea Garden Apartment Historic District. Both the district as a whole and each contributing building within the CEQA APE is **considered to be a historical resource for purposes of CEQA**.

Figure 67. Overview of Park La Brea Garden Apartment Historic District

Source: SWCA, 2022

[155] Architectural Resources Group. 2015. Appendix B: Historic Districts, Planning Districts and Multi-Property Resources. In *Survey LA Historic Resources Survey Report – Wilshire Community Plan Area*, p. 986. Prepared for the City of Los Angeles Office of Historic Resources.

[156] Architectural Resources Group, 2015, Appendix B, p. 986.

Figure 68. Overview of Park La Brea Garden Apartment Historic District, adjacent to the north, across 6th Street, from proposed project site

Source: SWCA, 2022

3. 600 S. CURSON AVENUE (5508-015-006) | CHR STATUS CODE: 6Z

This property was constructed in 1986 and remodeled extensively between approximately 2018 and 2021, according to building records on file with the City of Los Angeles Department of Building and Safety (Figure 69). The property was not evaluated as part of SurveyLA, due to its date of construction. Available sources do not indicate that the property was designed by a master architect, and the property does not appear to possess exceptional significance. Therefore, this property **is not a historical resource pursuant to CEQA**.

Figure 69. 600 S. Curson Avenue, "Museum Terrace" Apartments

Source: SWCA, 2022

4. 640 S. CURSON AVENUE (5508-015-008) | CHR STATUS CODE: 6Z

This property was constructed in 2021 (Figure 70). Available sources do not indicate that the property was designed by a master architect, and the property does not appear to possess exceptional significance. Therefore, this property **is not a historical resource pursuant to CEQA**.

Figure 70. 640 S. Curson Avenue, "One Museum Square" apartments

Source: SWCA, 2022

5. PRUDENTIAL SQUARE | 5757 W. WILSHIRE BOULEVARD | CHR STATUS CODE: 3S

In 2015 SurveyLA identified this historical resource as eligible for listing in the NRHP and CRHR and for designation as a local HCM. The 1948 office complex known as Prudential Square was designed by Wurdeman and Becket. Listed in Los Angeles County Tax Assessor data as 5757 W. Wilshire Boulevard, the Prudential Square complex spans the addresses of 5711–5779 W. Wilshire Boulevard

The property was found eligible under the context of Architecture and Engineering, 1850–1980, subcontext of L.A. Modernism, 1919–1980, theme of Post-War Modernism, 1946–1976, Corporate International, 1946–1976, under the commercial property type. The property meets NRHP Criterion C, CRHR Criterion 3, and local HCM criteria 3 as an "[e]xcellent example of a Corporate International style office and retail building on Wilshire's Miracle Mile, designed by notable local firm Wurdeman and Becket. This property was the first Corporate International building on Wilshire Boulevard and at the time of its construction was the largest of its type in the city."[157]

This building complex has not changed significantly since it was evaluated as part of the 2015 survey; this study carries forward the finding of NRHP, CRHR, and local HCM eligibility for Prudential Square (Figure 71). The building is therefore **considered to be a historical resource for purposes of CEQA**.

Figure 71. 5757 W. Wilshire Boulevard, Prudential Square

Source: SWCA, 2022

[157] Architectural Resources Group, 2015, Appendix A, p. 227.

6. 5800 W. WILSHIRE BOULEVARD | CHR STATUS CODE: 6Z

This 1958 office building was surveyed but not found eligible through the citywide survey, SurveyLA.

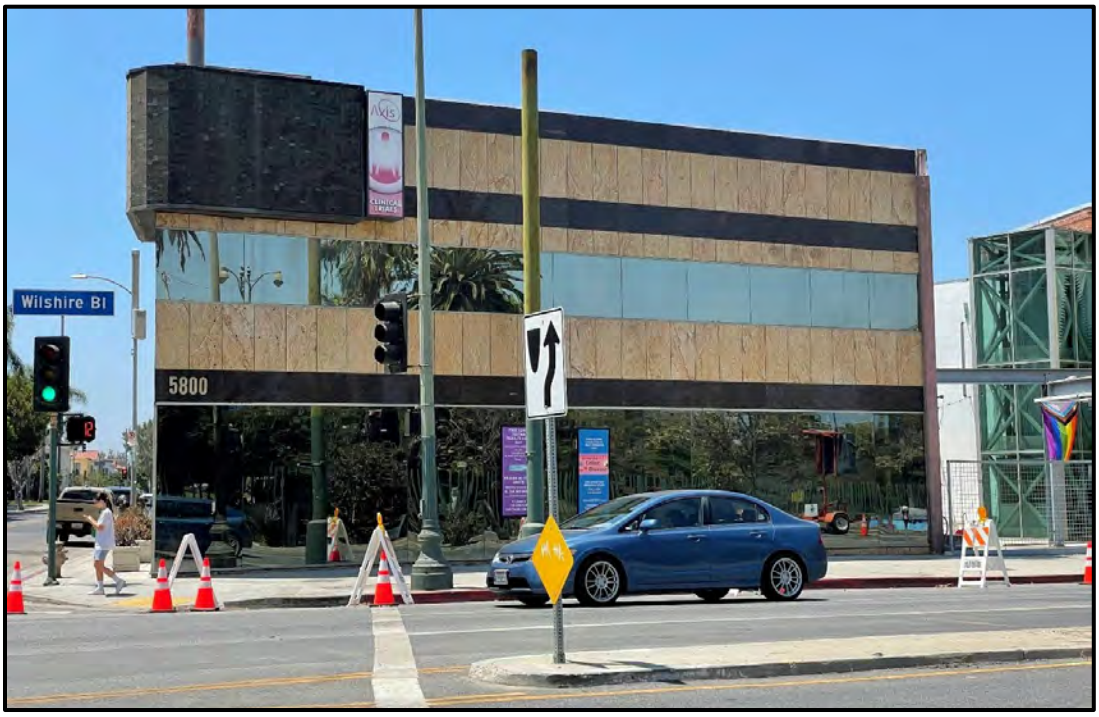
According to building records on file with the City of Los Angeles Department of Building and Safety, the most significant changes to the exterior of the property occurred in 2002. In 2002, permits were pulled for the following changes: 1) remove 40 feet of concrete shear wall at the ground floor at façade and replace with steel moment frames; 2) cut four openings measuring 5 feet by 5.3 feet at the ground floor of east wall; 3) extend lobby stairway from second floor to roof; 4) add 4 feet masonry parapet walls at roof; 5) in-fill all (seven) openings along west property line, along adjacent property at 5806 Wilshire; 6) revision to stairway, roof enclosure; 7) exterior façade alterations, new stairs and structural alterations, new window openings in east and west walls.

Due to these and other alterations, the current appearance of the property does not reflect its construction era; the building does not display the typical character-defining features of a postwar office building (Figure 72).

Available research did not indicate that the property has a significant association with events, patterns of development, or individuals significant in the history of the city, region, state, or nation.

The property **is therefore not a historical resource pursuant to CEQA**.

Figure 72. 5800 W. Wilshire Boulevard, south elevation



Source: SWCA, 2022

7. CRAFT AND FOLK ART MUSEUM | 5814 W. WILSHIRE BOULEVARD | CHR STATUS CODE: 3CS

In 2015 Survey LA identified the Craft and Folk Art Museum, built in 1930, as a historical resource eligible for listing in the CRHR and as an HCM. Listed in Los Angeles County Tax Assessor data as 5814 W. Wilshire Boulevard, the Craft and Folk Art Museum spans the addresses of 5814–5818 W. Wilshire Boulevard. Displaying an American Colonial Revival/French Revival style, the property was found eligible under the context of Neighborhood Commercial Development, 1875–1960, and the theme/subtheme of Neighborhood Commercial Development, 1875–1960/Early Neighborhood Commercial Development, 1880–1930, as a commercial property. The property meets CRHR Criterion 1/local HCM Criterion 1 under this context and theme as a "[r]are example of early neighborhood commercial development on Wilshire's Miracle Mile and an unusual two-story example of the property type. …Due to alterations including window and door replacements, the property does not retain sufficient integrity for listing in the National Register."[158]

The property was also found eligible under the context/subcontext of Public/Private Institutional Development, 1850–1980/Cultural Development and Institutions, 1850–1980 and the theme/subtheme of Visual Arts, 1888–1980/Producing, Displaying and Supporting Visual Arts, 1888–1980. The property meets CRHR Criterion 1/HCM Criterion 1 under this context/theme "as the long-time location of the Craft and Folk Art Museum, an important institution on Wilshire's Miracle Mile. The museum has been in continuous operation here since 1973."[159]

This building has not changed significantly since it was documented and evaluated as part of the 2015 survey; this study carries forward the finding of CRHR and local HCM eligibility for the Craft and Folk Art Museum (Figure 73). The property is therefore **considered to be a historical resource for purposes of CEQA**.

Figure 73. 5814 W. Wilshire Boulevard, Craft and Folk Art Museum, detail (top) and context (bottom)

Source: SWCA, 2022

[158] Architectural Resources Group, 2015, Appendix A, p. 228.

[159] Architectural Resources Group, 2015, Appendix A, p. 228.

8. HANCOCK PARK BUILDING | 5820 W. WILSHIRE BOULEVARD | CHR STATUS CODE: 3CS

In 2015, SurveyLA identified the Hancock Park office building as a historical resource eligible for listing in the CRHR and for designation as a local HCM. This 1958 International Style/Mid-Century Modern-style office building was designed by architects Jack H. MacDonald and Cejay Parsons. The property was found eligible under the context of Architecture and Engineering, 1850–1980, subcontext of L.A. Modernism, 1919–1980, theme of Post-War Modernism, 1946–1976, Corporate International, 1946–1976. The property was found to meet CRHR Criterion 3/HCM Criterion 3 as an "Excellent example of a Corporate International style commercial building on Wilshire's Miracle Mile."[160]

This building has not changed significantly since it was documented and evaluated as part of the 2015 survey; this study carries forward the finding of CRHR and local HCM eligibility for the Hancock Park Building (Figure 74). The property is therefore **considered to be a historical resource for purposes of CEQA**.

Figure 74. 5820 W. Wilshire Boulevard, Hancock Park Building

Source: SWCA, 2022

[160] Architectural Resources Group, 2015, Appendix A, p. 228.

9. CMAY GALLERY (FORMERLY ARTHUR MURRAY DANCE STUDIO) | 5828 W. WILSHIRE BOULEVARD | CHR STATUS CODE: 3S

In 2015, SurveyLA identified 5828 W. Wilshire Boulevard as a historical resource eligible for listing in the NRHP and CRHR and as an HCM. The property also occupies the addresses of 710 S. Stanley Avenue and 5826 W. Wilshire Boulevard. The property was found eligible under the context of Architecture and Engineering, 1850–1980, subcontext of L.A. Modernism, 1919–1980, theme of Post-War Modernism, 1946–1976, Mid-Century Modernism, 1945–1970. The property meets NRHP Criterion C, CRHR Criterion 3, and local HCM Criterion 3 as an "Excellent example of a Late Moderne…dance studio on Wilshire's Miracle Mile, designed by notable local architect Stiles O. Clements."[161]

This building has not changed significantly since it was documented and evaluated as part of the 2015 survey; this study carries forward the finding of NRHP, CRHR, and local HCM eligibility for 5828 W. Wilshire Boulevard (Figure 75). The property is therefore **considered to be a historical resource for purposes of CEQA**.

Figure 75. 5828 W. Wilshire Boulevard

Source: SWCA, 2022

[161] Architectural Resources Group, 2015, Appendix A, p. 229.

10. 5850 W. WILSHIRE BOULEVARD | CHR STATUS CODE: 3CS

In 2015 SurveyLA identified the building at 5850 W. Wilshire Boulevard as an historical resource eligible for listing in the CRHR and as an HCM. This International Style office building was designed in 1951 by notable local architect Stiles O. Clements. The property was found eligible under the context of Architecture and Engineering, 1850–1980, subcontext of L.A. Modernism, 1919–1980, theme of Post-War Modernism, 1946–1976, Corporate International, 1946–1976, under the commercial property type. The property was found to meet CRHR Criterion 3 and local HCM Criterion 3 as an "[e]xcellent example of a Corporate International-style commercial building on Wilshire's Miracle Mile, designed by notable local architect Stiles O. Clements. Due to alterations including window and door replacements, the property does not retain sufficient integrity for listing in the National Register."[162]

This building has not changed significantly since it was documented and evaluated as part of the 2015 survey; this study carries forward the finding of CRHR and local HCM eligibility for 5850 W. Wilshire Boulevard (Figure 76). The property is therefore **considered to be a historical resource for purposes of CEQA**.

Figure 76. 5850 W. Wilshire Boulevard

Source: SWCA, 2022

[162] Architectural Resources Group, 2015, Appendix A, p. 229.

11. VACANT LAND (5089-011-154)

This empty parcel was not evaluated or documented as it does not include a built-environment resource.

12. MUTUAL BENEFIT LIFE PLAZA | 5900 WILSHIRE BOULEVARD | CHR STATUS CODE: 3CS

Designed in 1969–1971 by master architects William Pereira and Gin D. Wong, the Mutual Benefit Life Plaza was found eligible for listing in the CRHR and as an HCM in 2015 by SurveyLA under the context of Architecture and Engineering, 1850–1980, subcontext of L.A. Modernism, 1919–1980, theme of Post-War Modernism, 1946–1976, Corporate International, 1946–1976. The property was found to meet CRHR Criterion 3 and local Criterion 3 as an "[e]xcellent example of a Corporate International-style commercial building on Wilshire's Miracle Mile, designed by notable local architects William Pereira and Gin D. Wong."[163] The property was found ineligible for the NRHP due to alterations.

This building has not changed significantly since it was evaluated as part of the 2015 survey; this study carries forward the finding of CRHR and local HCM eligibility for 5900 W. Wilshire Boulevard (Figure 77). The property is therefore **considered to be a historical resource for purposes of CEQA**.

Figure 77. Mutual Life Benefit Plaza, 5900 W. Wilshire Boulevard

Source: SWCA, 2022

[163] Architectural Resources Group, 2015, Appendix A, p. 230.

13. LACMA | 5905 WILSHIRE BOULEVARD | CHR STATUS CODE: N/A

As of July 2022, the New Formalist-style campus of the Los Angeles County Museum of Art, designed by William L. Pereira in 1965, has been demolished. Construction of a new museum is underway, and the site does not presently contain built environment elements.

7. IMPACTS ANALYSIS

Thresholds of Significance

Under CEQA, a project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. Substantial adverse change in the significance of a historical resource is defined as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired. The significance of a historical resource is materially impaired when a project demolishes or materially alters those physical characteristics that convey the significance of the resource and justify its inclusion (or eligibility for inclusion) in the NRHP, CRHR, or local register. In general, a project that follows the *Secretary's Standards*[164] and associated guidelines shall be considered as mitigated to below the level of significance.[165]

Resources located within the project footprint may be subject to direct impacts. Those resources located in the CEQA APE but not within the project footprint may be subject to indirect impacts.

Identification of Impacts

This report identified three historical resources within the project footprint: La Brea Tar Pits Historic District, George C. Page Museum, and Hancock Park Observation Pit.

In terms of properties within the project footprint, full build-out of the proposed project as described in this report **would result in significant adverse direct impacts** to historical resources. Specifically, project implementation would result in significant physical changes, partial demolition, and new construction affecting the following two of the three historical resources such that they would no longer convey the reasons for their significance:

- La Brea Tar Pits Historic District (5801 Wilshire Boulevard)
- George C. Page Museum (5801 Wilshire Boulevard)

For the third historical resource within the project footprint—the Observation Pit—**no significant adverse impacts** are anticipated; the property would not be altered as a result of project implementation as currently conceived and described in this report. (If the project changes, potential impacts to the Observation Pit would need to be considered, bearing in mind that use of the *Secretary's Standards* would mitigate potential adverse effects to less than significant.)

[164] Weeks, K.D., and A.E. Grimmer. 1995. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstruction Historic Buildings*. Washington, D.C.: U.S. Department of the Interior, National Park Service.

[165] California Code of Regulations, Title 14, Chapter 3. CEQA Guidelines. Section 15064.5(b).

In terms of properties outside the project footprint but within the CEQA APE, project implementation **would not be expected to result in significant adverse indirect impacts** resulting in material impairment to adjacent historical resources. Full build-out of the proposed project would not be expected to alter the setting and feeling of adjacent historical resources such that they would no longer convey the reasons for their significance. Although the project site's design configuration will change, new elements to be added are compatible in terms of land use and the relatively low profile of new construction when viewed from adjacent historical resources.

The following impacts analysis addresses each historical resource within the CEQA APE. At present, the La Brea Tar Pits Master Plan consists of a wide range of preliminary plans. Although changes are proposed to the Page Museum, which is a historical resource, schematic-level detail is not yet available to characterize and assess each proposed alteration for compliance with the *Secretary's Standards*. Given the level of design available and the extended construction window, this impacts analysis therefore addresses the proposed project with a focus on the nine principal project components included in the master plan:

- Page Museum Renovations (#1)
- Wilshire Gateway Entry Plaza and Lake Pit (#2)
- Enhanced Central Green (#3)
- Revamped Pit 91 (#4)
- New Museum Building (#5)
- New Public Promenade (#6)
- New Pedestrian Path (#7)
- 6th Street Entry Gateway (#8)
- Support Building (#9)

For ease of review, the proposed site plan map for the La Brea Tar Pits Master Plan is presented below, with the nine major project components labeled and numbered. The following impacts analysis cross-references the project components and numbers shown in Figure 78.

Figure 78. Elements of the Proposed Site Plan, La Brea Tar Pits Master Plan

Discussion of Direct Impacts

This section addresses the potential **direct significant adverse impacts** to identified historical resources within the project footprint. Impacts are discussed in terms of changes to character-defining and contributing features of historic resources.

1. LA BREA TAR PITS HISTORIC DISTRICT (INSIDE PROJECT FOOTPRINT)

As noted in Section 6 (Historic Resources Survey and Results), the La Brea Tar Pits Historic District consists of numerous related contributors and character-defining features embodying the district's significance. This includes archaeological and paleontological resources (considered in separate reports); related buildings and structures; landscaping and hardscaping features; and site-plan configuration and spatial relationships characterizing the property. Taken together, these elements reflect a shared story of nearly 100 years of purposeful preservation of the Hancock Park land and its resources, scientific excavation and curation, and design and construction of facilities for public education and exhibits.

In addition, as described in Section 5 (Historic Setting and Context), master planning efforts for Hancock Park, which included a long-term plan for an on-site museum, stopped and started over the years. As a result, the district and its components display an eclectic character, developed in phases.

The proposed project envisions a comprehensive, unified master plan/design for the La Brea Tar Pits, which has been a long-term goal for Hancock Park. The proposed master plan is intended to expand scientific research and enhance the visitor's experience through a continuous, thematic circulation route, the addition of more shade structures and expanded, enhanced facilities, and an aesthetic upgrade for facilities, landscaping and hardscaping, and the park. Overall, the master plan would more explicitly integrate and brand Hancock Park and the La Brea Tar Pits for pedestrians approaching or passing on Wilshire Boulevard and on 6th Street, with proposed new gateways, signage, and fencing.

As a reimagining of the La Brea Tar Pits complex, the proposed project introduces a series of new features, buildings, structures, circulation corridors, and other elements that would fill-in and divide the components of the historic district, shifting the setting and feeling of the historic district and removing some of its character-defining features. The proposed project design is preliminary; however, as presently envisioned, the project elements that would impact contributing components and character-defining features of the historic district are described below. (Map labels for each project component, as shown in Figure 78, are noted in this section for ease of review.)

Page Museum Renovations (#1), New Public Promenade (#6), and New Museum Building (#5)

These project elements have the most immediate, direct impact to the historic district (as well as the Page Museum and its character-defining features and site, discussed specifically below). These changes focus on the principal built-environment resource and a focal point of the historic district, the Page Museum.

As noted previously, among the primary character-defining features of the Page Museum are its orthogonal site, which includes not just the museum but the raised berm surrounding and defining it on each side; the expansive lawn adjacent to the west, which contributes to the visual primacy and prominence of the Page Museum; and the relative absence of numerous other built-environment features around it.

The proposed project would eliminate the berms on the west and north elevations. Furthermore, a sizable portion of the northwest corner of the museum would be demolished and replaced to accommodate a

connection point to the new museum building and the covered, curved arcade and promenade. As shown in Figure 79, berms along the west and north would be built-up to create a curved public promenade; the new museum building would also be constructed behind the Page Museum. The new site design and construction would envelop and extend the Page Museum and its site along the west and north elevations.

In this way, the primacy of the Page Museum within the existing site design would be diminished; at present, the museum is a stand-alone focal point of the La Brea Tar Pits complex. As envisioned, the proposed project would incorporate the Page Museum into a connected three-part complex, with a pathway replacing the character-defining berms on the west and north. The new museum building would also compete with the Page Museum to the point of making it appear to be a supplemental annex to the larger new facility.

Wilshire Gateway Entry Plaza & Lake Pit (#2)

This project element would replace the diagonal pathway leading into the park in the southeast corner (a character-defining feature) with a curved pathway and entry plaza. A pedestrian bridge and pathway would lead over the Lake Pit, which would replace the main entrance/walkway to the park and visually divide the Lake Pit. The visibility of the lake and statues from Wilshire Boulevard, in particular westbound, would potentially be diminished, thus affecting the visual role the La Brea Tar Pits play in the surrounding environment.

In addition, without additional project detail, it is not possible at the present time to eliminate from consideration possible physical impacts to the lake itself from the bridge's structural elements.

When considered in tandem with other master plan elements affecting character-defining features, this project component would impact the aspects of "setting" and "feeling" of the historic district (as described in Section 3, Regulatory Setting) and would contribute to the overall loss of integrity.

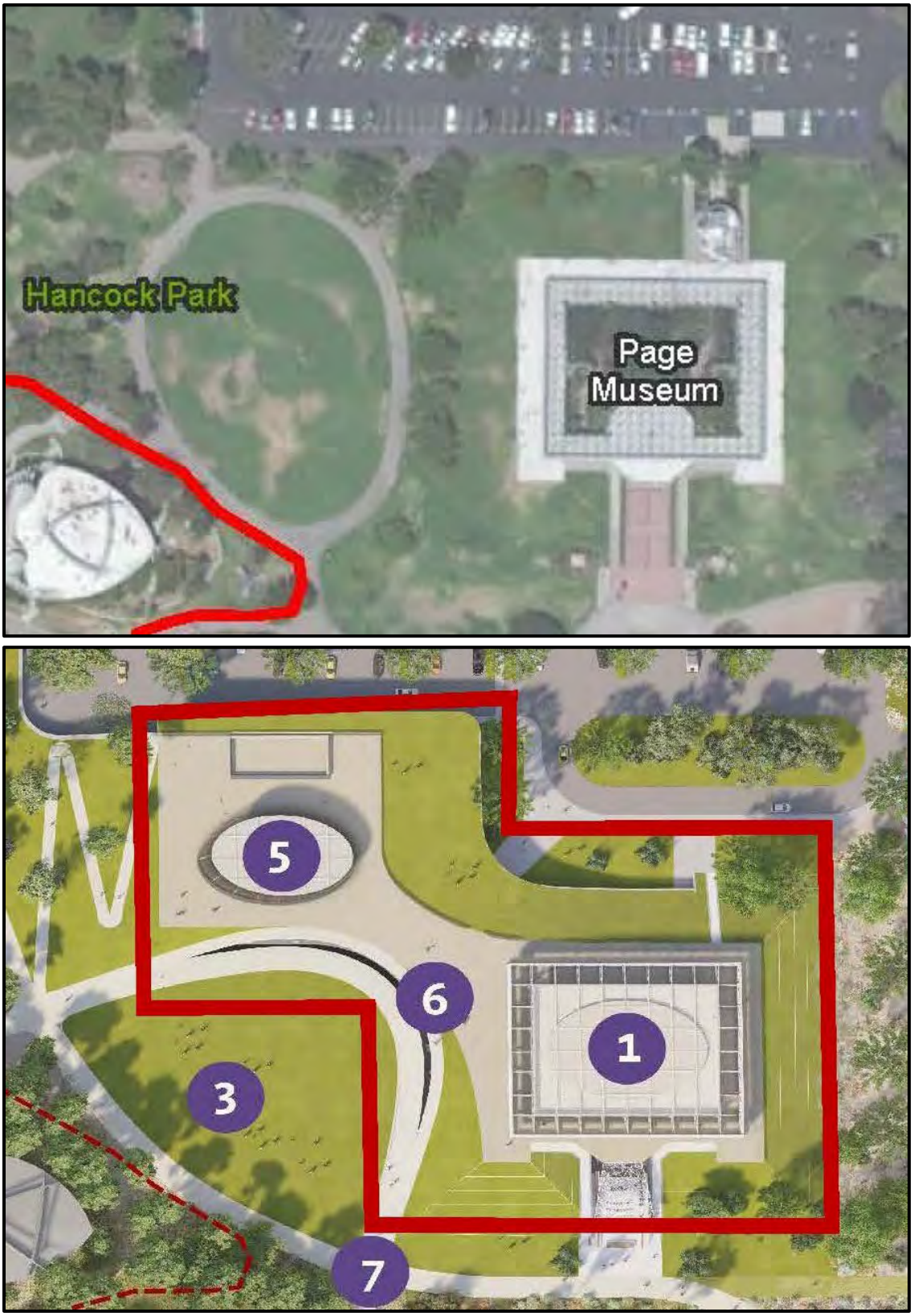
Enhanced Central Green (#3)

This project element would affect the lawn west of the Page Museum, which is considered a character-defining feature of the historic district. The lawn would be retained, but the size would be reduced. At present, the lawn provides an open space and unimpeded view to the Page Museum. In the proposed project, the lawn would be enveloped in the new, curved pedestrian path. When considered in tandem with other master plan elements affecting character-defining features, this project component would impact the aspects of "setting" and "feeling" of the historic district (as described in Section 3, Regulatory Setting) and would contribute to the overall loss of integrity.

Revamped Pit 91 (#4)

This project element would not affect identified character-defining features or contributing elements of the La Brea Tar Pits Historic District such that, on its own, it would cause or contribute to a significant adverse impact to the La Brea Tar Pits Historic District. This project element would retain the contributing feature (tar pits) and replace temporary construction and buildings with a permanent exhibition area. The extended chain fencing would be removed. The project would construct viewing areas around each of the tar pits, with improved pit protection zones and fencing, seating, and interpretive signage. The project would remove and replace noncontributing temporary storage and research buildings adjacent to Project 23.

Figure 79. Current site configuration (top) and project elements #1 (Page Museum Renovations), #5 (New Museum Building), and #6 (New Public Promenade) (bottom)



New Pedestrian Path (#7)

The New Pedestrian Path would create a unified circulation corridor throughout the park and would shift the main entrance/approach. Affected character-defining features include the diagonal entrance/walkway at the corner of Wilshire Boulevard and Curson Ave (as noted above)., historic trees along the north; and the overall configuration of park features connected by meandering paths. Contributing pathways include the southeast entry diagonal path, the path along the northside of the Lake Pit, and the tree-shaded paths west of the parking area.

When considered in tandem with other master plan elements affecting character-defining features, this project component would impact the aspects of "setting" and "feeling" of the historic district (as described in Section 3, Regulatory Setting) and would contribute to the overall loss of integrity.

6th Street Entry Gateway (#8) and Support Building (#9)

These project elements would not affect identified character-defining features or contributing elements of the La Brea Tar Pits Historic District such that a distinct, direct or indirect impact to the La Brea Tar Pits Historic District would be expected.

Table 7 summarizes the primary character-defining features of the district, along with those project components most relevant in terms of potential impacts, and the aspects of integrity most likely to be impacted by project implementation.

In summary, for the eligible La Brea Tar Pits Historic District, full build-out of the proposed project, with the variety of design updates, upgrades, and new construction planned for the site would result in a **significant adverse direct impact** to the district (direct impacts to the Page Museum are addressed separately below). Implementation of the master plan, which represents a comprehensive redesign of Hancock Park, would erode and interrupt the eclectic but cohesive character-defining features of this historic district such that it would no longer convey the reasons for its significance as a CRHR and locally eligible historic district. Each one of the project elements on its own would not affect the district's eligibility to the extent that it would be materially impaired (except for alterations to the Page Museum, addressed below).

Cumulatively, however, the implementation of all these changes would result in a significant adverse impact to the La Brea Tar Pits Historic District. The loss of eligibility of the resource represents material impairment and an impact to the environment.

Table 7. Potential Impacts on Character-Defining Features, La Brea Tar Pits Historic District

Primary Character-Defining Feature	Is feature retained?	Relevant and/or Adjacent Project Component/s	Aspects of integrity potentially impacted by project element implementation	*Secretary's Standards for Rehabilitation* in potential noncompliance with project element
Oversized, sparsely developed parcel, with large swaths of open park space	Yes	▪ **New Museum Building (#5)** and **New Public Promenade (#6)** would reduce open park space with additional construction ▪ The site's oversized parcel and some open space/recreational areas would be retained though diminished	Setting; Feeling	Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Lake Pit	Yes	▪ **Wilshire Gateway Entry Plaza & Lake Pit (#2)** and **New Pedestrian Path (#7)** would change the configuration of the corner entrance to the park ▪ The Lake Pit, which is one of the key contributing resources to the historic district; would be preserved ▪ A pathway and bridge would lead over the Lake Pit	Setting	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 4: Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
Mature trees framing Hancock Park, with concentrations along the north and east	Partially	▪ **Landscaping plan** would remove a number of the historic trees appearing to date to the 1920s establishment of Hancock Park	Design; Setting; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 4: Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
Page Museum and its site, with pyramidal massing, square plan, and sharply raised berms; visual prominence of Page Museum (see Table 8 for potential impacts to individually eligible Page Museum)	Partially	▪ **Page Museum Renovations (#1), New Museum Building (#5), and New Public Promenade (#6)** would change these character-defining features ▪ West and north berms would be removed/built up to accommodate promenade ▪ Pyramidal massing would be mostly replaced ▪ Open-air roof, podium, and central atrium, would be covered ▪ Visual primacy of the Page Museum would be diminished	Design; Materials; Workmanship; Setting; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 3: Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken. Rehabilitation Standard No. 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired
Observation Pit	Yes	▪ Circulation corridors and landscaping adjacent to the Observation Pit have been altered over time ▪ The closest project element, a portion of the **New Pedestrian Path (#7),** would resemble the land use patterns, hardscaping, and circulation corridors already adjacent to this historic resource	Some changes to adjacent Setting (but minimal given level of recent alteration in landscaping in the northwest quadrant of Hancock Park)	Complies with *Secretary's Standards*
Corner entrance with diagonal entry path at Wilshire Boulevard	Partially	▪ **Wilshire Gateway Entry Plaza and Lake Pit (#2)** would shift the corner entrance to a new entry point further west on Wilshire Boulevard ▪ This project element would remove the character-defining diagonal entry and pathway	Design; Setting; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 3: Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken. Rehabilitation Standard No. 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired

Primary Character-Defining Feature	Is feature retained?	Relevant and/or Adjacent Project Component/s	Aspects of integrity potentially impacted by project element implementation	*Secretary's Standards for Rehabilitation* in potential noncompliance with project element
Circulation corridors/pathways, including east-west pathways leading from parking lot and north-south pathway northwest from central lawn	Partially	▪ **Enhanced Central Green (#3), New Museum Building (#5), New Pedestrian Path (#7)** would alter/replace some of the character of character-defining circulation corridors and pathways of the historic district ▪ Pathways and circulation corridors dating to the period of significance, which reflect the district's development over time, would be replaced with a unified system and series of designed pathways and landscaping; new construction would interrupt or remove these extant features	Setting; Feeling	Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Remnants of 1930s stone walls in northwestern portion of site	Unknown; it is possible that implementation of the Master Plan could remove this feature	▪ Landscaping plan and/or facilities upgrades to tar pits and seep sites could impact this feature and other extant remnants of stone walls	Design; Materials; Setting; Feeling	Unknown at this time because the project is conceptual in nature and the Master Plan does not provide specific information on whether the remnants of 1930s stone walls would be retained or removed. The potential exists for impacts to adjacent historical resources through construction staging, construction activities, and implementation of project landscaping. Construction staging activities should be carefully designed to plan for and avoid any adjacent historical resources (including but not limited to details regarding off-site staging, parking, equipment and material storage, movement, and use).
Significant paleontological resources on the site, including various dig and studies sites	Yes	▪ **Revamped Pit 91 (#4)** would remove temporary facilities that are not considered character-defining ▪ The significant resources would be preserved ▪ Temporary facilities would be replaced and upgraded	None; the improved facilities would enhance visibility of these significant cultural resources	While the project complies with the Secretary's Standards at this stage of the design process, the potential exists for impacts to adjacent historical resources through construction staging and construction activities. Construction staging activities should be carefully designed to plan for and avoid any adjacent historical resources (including but not limited to details regarding off-site staging, parking, equipment and material storage, movement, and use).

2. PAGE MUSEUM, LA BREA TAR PITS (INSIDE PROJECT FOOTPRINT)

Full build-out of the proposed project would result in a **direct, significant adverse impact** to the Page Museum, which is an historical resource pursuant to CEQA (eligible for the NRHP, CRHR, and as a local HCM). Therefore, the project would cause an impact to the environment through material impairment of a historical resource.

While the project plans remain preliminary at this stage, they include elements that do not comply with the *Secretary's Standards*. Not all projects that depart from the *Secretary's Standards* cause significant adverse impacts; however, the remodel of the Page Museum, in addition to including seismic and systems upgrades necessary for the building's long-term viability, also includes major alterations to key character-defining features. These alterations include:

- Elimination of the sharply raised berms on the west and north elevations of the museum site
- Eliminating the indoor-outdoor integration provided by the open roof, podium, and central atrium, by adding a roof structure and photovoltaic panels and enclosing the open space at the podium with fenestration
- Adding windows beneath the Pleistocene-era frieze, which will diminish the museum's high degree of indoor-outdoor integration and the visual prominence of the frieze as one of the key character-defining features of the museum
- Shifting the principal entrance to the new museum building; the principal, descending entrance ramp to the Page Museum would retained physically but converted in use to serve as an outdoor classroom space; the main entrance to the museum would shift to the annex to the west
- Demolition of a portion of the museum's northwest corner
- A site redesign in which the Page Museum, which is presently a prominent, stand-alone feature, would be incorporated as one component of an integrated, connected three-part complex, including built-up berms on the west and north, a public promenade, and new museum building; new construction does not include visual, physical distinctions and separations between the old and the new
- Construction of the new museum building, which, though on par with or slightly higher than the Page Museum, would visually compete with the Page Museum

Taken together, these planned alterations to the Page Museum would compromise its historic integrity to the point that the historical resource would no longer convey the reasons for its significance.

Table 8 below provides an overview of the affected character-defining features for each project component, as applicable and to the extent that project-level detail is available.

Project plans for the Page Museum are preliminary at this stage of the design process. However, as currently envisioned, though the Page Museum would be retained, implementation of the proposed project would be expected to result in a **significant adverse direct impact** to the historic resource, which is currently eligible for the NRHP, CRHR, and as a local HCM. The loss of eligibility of the Page Museum represents material impairment to the historical resource and an impact to the environment.

Table 8. Potential Impacts to Character-Defining Features, Page Museum Renovations

Primary Character-Defining Feature	Is feature retained?	Conceptual Project Plans	Aspects of integrity potentially impacted by project element	*Secretary's Standards for Rehabilitation* in potential noncompliance with conceptual project element
Oversized one-story mass/height	Yes	▪ The height of the building would be retained ▪ Seismic upgrades would be achieved through addition of shear-wall supports that would be concealed from view	N/A	Could comply with *Secretary's Standards* (if seismic upgrades are, as described, hidden and any significant historic fabric that is disturbed by the construction is repaired and re-installed or replaced in-kind).
Prominent fiberglass frieze with bas relief Pleistocene scenes and pronounced roof overhangs	Partially	▪ The roof frieze would be retained ▪ Windows would be installed beneath the frieze, sealing the open space presently characterizing the podium	Design; Workmanship, Materials; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Fishbowl-like laboratory space in museum interior	Yes	▪ The fishbowl-like laboratory would be retained	While at a preliminary design stage, this project element would not be expected to result in significant adverse impacts if all project components are designed to comply with the *Secretary's Standards*	Could comply with *Secretary's Standards* (if character-defining features of the laboratory space are retained and/or replaced in-kind).
Burial mound-like site with sharply raised berms with turf plantings on each side, pyramidal massing, and a square plan	Partially	▪ Berms on the west and north would be removed and built up to accommodate New Public Promenade (#6) ▪ Site's pyramidal massing would be replaced ▪ Topography and character of west and north berms would be changed to accommodate promenade connecting Page Museum with new building, via curved arcade	Design; Setting; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Symmetrical design composition, building and site	Partially	▪ Symmetrical design composition of the Page Museum itself would be largely retained ▪ Symmetrical design composition of the site would not be retained ▪ Page Museum site would be changed and incorporated into/extended by the curved New Public Promenade (#6) and new museum building (#5)	Design; Setting; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Descending entrance progression on south elevation into the center of the building, flanked by mirror stairways leading to the upper podium at the second-floor	Partially	▪ The Page Museum's primary entrance would shift to serve as an outdoor classroom ▪ The entrance would remain operational ▪ New ADA-accessible ramps would flank the outdoor classroom space ▪ A cantilevered shade structure is proposed for the Page Museum entrance, which is presently open-air	Design; Materials; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Primary Character-Defining Feature	Is feature retained?	Conceptual Project Plans	Aspects of integrity potentially impacted by project element	*Secretary's Standards for Rehabilitation* in potential noncompliance with conceptual project element
Indoor-outdoor integration; open-air roof; open configuration at the podium level overlooking atrium	No	▪ Indoor-outdoor integration of the Page Museum itself would be severely diminished ▪ Open-air configuration of the roof and podium would be covered/sealed ▪ Open-air roof would be covered, with proposed materials to include photovoltaic panels ▪ Windows would be installed at the podium level, closing the open-air design	Design; Materials; Workmanship; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Open central atrium with landscaping	No	▪ The open, central atrium with landscaping would be removed and replaced	Design; Materials; Workmanship; Feeling	Rehabilitation Standard No. 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. Rehabilitation Standard No. 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved. Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Visual primacy as principal built-environment feature of historic district	No	▪ New construction on site, including the New Museum Building (#5) and New Public Promenade (#6) along with changes to the Enhanced Central Green (#3) would diminish the Page Museum's visual primacy at the La Brea Tar Pits Historic District	Design; Setting; Feeling	Rehabilitation Standard No. 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. Rehabilitation Standard No. 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

3. OBSERVATION PIT (INSIDE PROJECT FOOTPRINT)

The proposed project does not include changes to the Observation Pit. In addition, the site and surroundings have already been updated and altered over time, and the closest project element, a portion of the New Pedestrian Path (see Figure 78, Project Element #7) would resemble the land use patterns, hardscaping, and circulation corridors already adjacent to this historical resource. Therefore, **no significant adverse direct impacts** to the Observation Pit are expected to result from project implementation.

Discussion of Indirect Impacts

In summary, **no significant adverse indirect impacts** of adjacent historical resources would occur with implementation of the proposed master plan. This finding, described in more detail below, is based on the overall compatibility of master plan elements in terms of land use, general character, mass/scale, and design and that indirect effect would not result in material impairment of adjacent historical resources. This finding is also based on the assumption that protective precautions related to construction activities and staging locations will be taken as the conceptual plans evolve.

The following section addresses each of the proposed project's eight adjacent historic resources.

1. PAVILION FOR JAPANESE ART

Implementation of the proposed master plan would not be expected to result in significant, adverse indirect impacts to the point of material impairment of the Pavilion for Japanese Art.

The surrounding land uses, which currently consist of landscaping, pathways, and the elements of the tar pits complex, would be retained, albeit with a new design configuration. In terms of new construction, the new museum building (see Figure 78, Project Element #5) planned for the park's northwestern quadrant would be located at a significant distance from the Pavilion for Japanese Art; the scale/mass and design of the new museum building as it is characterized at this stage of the design process would not be expected to overwhelm or otherwise significantly impact the setting and feeling of the Pavilion for Japanese Art to the point that it would no longer convey the reasons for its significance. The closest project element to the Pavilion for Japanese Art would be the New Pedestrian Path (see Figure 78, Project Element #7); at present, this area of the park already includes various walkways and landscaping.

In addition, the Pavilion for Japanese Art is closest to/oriented towards the new LACMA facility, which represents a more significantly altered change in setting than the master plan for the La Brea Tar Pits.

In summary, the master plan elements adjacent to the resource would be compatible in terms of use, character, mass/scale, and design and **no significant adverse indirect impacts** are expected to the Pavilion for Japanese Art from project implementation.

This finding is based on the assumption that protective precautions related to construction activities and staging locations will be taken as the project plans evolve.

2. PARK LA BREA GARDEN APARTMENT HISTORIC DISTRICT

Implementation of the proposed project would not be expected to result in significant, adverse indirect impacts to the point of material impairment of the Park La Brea Garden Apartment Historic District.

This large historic district forms the northern border of the CEQA APE for this project analysis. The contributors to the district are located across a wide expanse of West 6th Street and screened by the mature trees and landscaping of Hancock Park. Master plan elements facing the Park La Brea Garden Apartment Historic District would be compatible in terms of land use, character, mass/scale, and design. In addition, the new museum building (see Figure 78, Project Element #5), which would be across 6th Street, is sited at enough of a distance and exhibiting a modest mass/scale that it would not be expected to result in material impairment to the historic resource such that it would no longer convey the reasons for its significance.

In summary, **no significant adverse indirect impacts** are expected to result from project implementation to the Park La Brea Garden Apartment Historic District.

3. PRUDENTIAL SQUARE (5757 W. WILSHIRE BOULEVARD)

Implementation of the proposed master plan would not be expected to result in significant, adverse indirect impacts to the point of material impairment of Prudential Square (5757 W. Wilshire Boulevard).

This 1948 office complex, designed by Wurdeman and Becket, occupies the CEQA APE's southeast corner. Surrounding land uses would be retained, as the La Brea Tar Pits would remain a public park with hardscaping/pathways, landscaping and open space, interspersed with institutional facilities and tar pits/excavation sites, albeit with a new design configuration and additions. The closest project element to Prudential Square would be the Wilshire Gateway Entry Plaza & Lake Pit (see Figure 78, Project Element #2). This element would renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza. These changes to the corner entrance to the park retain the existing land uses and are compatible in terms of character, mass/scale, and design when seen from the perspective of this facing historic resource.

In summary, **no significant adverse indirect impacts** would be expected to result to Prudential Square from project implementation.

4. CRAFT AND FOLK ART MUSEUM (5814 W. WILSHIRE BOULEVARD)

Implementation of the proposed master plan would not be expected to result in significant, adverse indirect impacts to the point of material impairment of the Craft and Folk Art Museum (5814 W. Wilshire Boulevard).

Constructed in 1930, the Craft and Folk Art Museum is an American Colonial Revival/French Revival style building located south of the proposed project site, across Wilshire Boulevard. The facing, extant land uses would be retained, as the La Brea Tar Pits would remain a public park with hardscaping/pathways, landscaping and open space, interspersed with institutional facilities and tar pits/excavation sites, albeit with a new design configuration and additions. The closest project element to the Craft and Folk Art Museum would be the Wilshire Gateway Entry Plaza & Lake Pit (see Figure 78, Project Element #2). This project element would renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza. In addition, from this vantage point of Wilshire Boulevard, the New Pedestrian Path (see Figure 78, Project Element #7) would add a curved walkway over the Lake Pit that would be visible from across Wilshire Boulevard. However, these changes retain the existing land uses and are compatible in terms of character, mass/scale, and design when seen from the perspective of this adjacent historic resource.

In summary, **no significant adverse indirect impacts** would be expected to result to the Craft and Folk Art Museum from project implementation.

5. HANCOCK PARK BUILDING (5820 W. WILSHIRE BOULEVARD)

Implementation of the proposed master plan would not be expected to result in significant, adverse indirect impacts to the point of material impairment of the Hancock Park Building (5820 W. Wilshire Boulevard).

Located south of the project site across Wilshire Boulevard, the Hancock Park Building was designed in 1958 in the International/Mid-Century Modern style by architects Jack H. MacDonald and Cejay Parsons. The building is located south of the proposed project site, across Wilshire Boulevard The facing, extant land uses would be retained, as the La Brea Tar Pits would remain a public park with hardscaping/pathways, landscaping and open space, interspersed with institutional facilities and tar pits/excavation sites, albeit with a new design configuration and additions. The closest project element to the Hancock Park Building would be the Wilshire Gateway Entry Plaza & Lake Pit (see Figure 78, Project Element #2). This project element would renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza. In addition, from this vantage point of Wilshire Boulevard, the New Pedestrian Path (see Figure 78, Project Element #7) would add a curved walkway over the Lake Pit that would be visible from across Wilshire Boulevard. However, these changes retain the existing land uses and are compatible in terms of character, mass/scale, and design when seen from the perspective of this adjacent historic resource.

In summary, **no significant adverse indirect impacts** would be expected to result to the Hancock Park Building from project implementation.

6. CMAY GALLERY (FORMERLY ARTHUR MURRAY DANCE STUDIO, (5828 W. WILSHIRE BOULEVARD)

Implementation of the proposed master plan would not be expected to result in significant, adverse indirect impacts to the point of material impairment of the CMAY Gallery (5828 W. Wilshire Boulevard).

Located south of the project site across Wilshire Boulevard, CMAY Gallery (formerly the Arthur Murray Dance Studio) was designed in 1947 by notable local architect Stiles O. Clements in the Late Moderne style. The building is located south of the proposed project site, across Wilshire Boulevard. The facing, extant land uses would be retained, as the La Brea Tar Pits would remain a public park with hardscaping and pathways, landscaping and open space, interspersed with institutional facilities and tar pits/excavation sites, albeit with a new design configuration and additions. The closest project element to the CMAY Gallery would be the Wilshire Gateway Entry Plaza & Lake Pit (see Figure 78, Project Element #2). This project element would renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza. In addition, from this vantage point of Wilshire Boulevard, the New Pedestrian Path (see Figure 78, Project Element #7) would add a curved walkway over the Lake Pit that would be visible from across Wilshire Boulevard. However, these changes retain the existing land uses and are compatible in terms of character, mass/scale, and design when seen from the perspective of this adjacent historic resource.

In summary, **no significant adverse indirect impacts** would be expected to result to the CMAY Gallery from project implementation.

7. OFFICE BUILDING (5850 W. WILSHIRE BOULEVARD)

Implementation of the proposed master plan would not be expected to result in significant, adverse indirect impacts to the point of material impairment of the office building at 5850 W. Wilshire Boulevard.

Located south of the project site across Wilshire Boulevard, 5850 W. Wilshire Boulevard was designed in 1951 in the International Style by well-known local architect Stiles O. Clements. The building is located south of the proposed project site, across Wilshire Boulevard. The facing, extant land uses would be retained, as the La Brea Tar Pits would remain a public park with hardscaping/pathways, landscaping and open space, interspersed with institutional facilities and tar pits/excavation sites, albeit with a new design configuration and additions. The closest project element to 5850 W. Wilshire Boulevard would be the Wilshire Gateway Entry Plaza & Lake Pit (see Figure 78, Project Element #2). This project element would renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza. In addition, from this vantage point of Wilshire Boulevard, the New Pedestrian Path (see Figure 78, Project Element #7) would add a curved walkway over the Lake Pit that would be visible from across Wilshire Boulevard. However, these changes retain the existing land uses and are compatible in terms of character, mass/scale, and design when seen from the perspective of this adjacent historic resource.

In summary, **no significant adverse indirect impacts** would be expected to result to 5850 W. Wilshire Boulevard from project implementation.

8. MUTUAL BENEFIT LIFE PLAZA (5900 WILSHIRE BOULEVARD)

Implementation of the proposed master plan would not be expected to result in significant, adverse indirect impacts to the point of material impairment of the Mutual Benefit Life Plaza (5900 W. Wilshire Boulevard).

Located southwest from the project site across Wilshire Boulevard, the Mutual Benefit Life Plaza was designed in 1969–1971 by notable local architects William Pereira and Gin D. Wong. The building complex is located southwest of the proposed project site, across Wilshire Boulevard. The facing, extant land uses would be retained, as the La Brea Tar Pits would remain a public park with hardscaping/pathways, landscaping and open space, interspersed with institutional facilities and tar pits/excavation sites, albeit with a new design configuration and additions. Although not directly adjacent, the closest project element to 5850 W. Wilshire Boulevard would be the Wilshire Gateway Entry Plaza & Lake Pit (see Figure 78, Project Element #2). In addition, from this vantage point southwest of the project site, the New Pedestrian Path (see Figure 78, Project Element #7) would add a curved walkway over the Lake Pit that would be partially visible from across Wilshire Boulevard to the southwest. However, these changes retain the existing land uses and are compatible in terms of character, mass/scale, and design when seen from the perspective of this adjacent historic resource.

In summary, **no significant adverse indirect impacts** would be expected to result to 5900 W. Wilshire Boulevard from project implementation.

8. CONCLUSION AND RECOMMENDATIONS

As a result of this study, SWCA identified **two separate, significant and unavoidable direct adverse impacts to historical resources**: one to the La Brea Tar Pits Historic District, and the other to the Page Museum.

Based on available project information, following full build-out of the La Brea Tar Pits Master Plan, neither the La Brea Tar Pits Historic District nor the Page Museum would be expected to remain historical resources pursuant to CEQA. The project would retain the Page Museum and numerous contributing features of the historic district. However, the character-defining and contributing features of both historical resources could be significantly altered to the point that they would no longer be anticipated to retain eligibility.

At present, the Page Museum is individually eligible for the NRHP, CRHR, as a County landmark, and as City HCM. The La Brea Tar Pits Historic District is eligible as a historic district for the CRHR and at the County and City level.

This loss of eligibility translates into material impairment, as neither property would qualify as a historical resource pursuant to CEQA following project implementation.

In terms of indirect impacts, this study concluded that, based on available project information, **no significant indirect adverse impacts** would result from project implementation. The proposed project does not yet include detailed information on construction staging locations or activities, which may impact adjacent historical resources. Based on this, it is recommended that the EIR include enforceable mitigation measures for historical resources construction monitoring to ensure that any construction staging activities are designed to avoid potential indirect impacts to adjacent historical resources.

Due to the likelihood of direct, significant adverse impacts to historic resources, the Draft EIR must include a range of feasible alternatives and mitigation measures. Alternatives may include but not necessarily be limited to options exploring reduced project alternatives that would achieve most project objectives while reducing impacts to historical resources to less than significant. Enforceable mitigation measures and/or project design features to address in the EIR will include options that are feasible, have a proportional nexus with the project impacts, and are capable of reducing, avoiding, or mitigating impacts, at the project- and program-level.

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APPENDIX E

Geology and Soil Discipline Report

SUBMITTED TO:

Natural History Museums of
Los Angeles County
900 Exposition Boulevard
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BY:

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GEOLOGY AND SOIL DISCIPLINE REPORT

La Brea Tar Pits Museum Master Plan Project

5801 WILSHIRE BOULEVARD, LOS ANGELES, CALIFORNIA

SHANNON & WILSON

January 27, 2023

Shannon & Wilson No: 109748-001

Submitted To: Natural History Museums of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007
Attn: Mr. Jesse Rocha

Subject: GEOLOGY AND SOIL DISCIPLINE REPORT, LA BREA TAR PITS MUSEUM MASTER PLAN PROJECT, 5801 WILSHIRE BOULEVARD, LOS ANGELES, CALIFORNIA

Shannon & Wilson prepared this report and participated in this project as a consultant to the Los Angeles County Museum of Natural History Foundation. Our scope of services was specified in Contract Service Agreement Ledger No. 1-1-2-102-470-4250, dated August 16, 2022. This report presents our geology and soils discipline report and was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON

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Appendices

Appendix A: Past S&W and VB&B Field Explorations
Appendix B: Previous Explorations by Others
Important Information

ACRONYMS

AMMP	Academy Museum of Motion Pictures
BCAM	Broad Contemporary Art Museum
bgs	below ground surface
BPC	LACMA Building for Permanent Collection
CalGEM	State of California Department of Conservation, Geologic Energy Management Division
CBC	California Building Code
CDMG	California Division of Mines and Geology
CGS	California Geological Survey
City	City of Los Angeles
CLABC	County of Los Angeles Building Code
County	County of Los Angeles
DOGGR	State of California Department of Conservation, Division of Oil, Gas and Geothermal Resources
DWR	California Department of Water Resources
EI	Expansion Index
GMED	County of Los Angeles Department of Public Works Geotechnical and Materials Engineering Division
IBC	International Building Code
LACMA	Los Angeles County Museum of Art
LA Metro	Los Angeles County Metropolitan Transportation Authority
LCA	LeRoy Crandall and Associates
MCE	Maximum Considered Earthquake
MKA	Magnusson Klemencic Associates
mm	millimeter
M_w	Earthquake Moment Magnitude
NHMLAC	Natural History Museums of Los Angeles County
Page Museum	George C. Page Museum of La Brea Discoveries
PGA	peak ground acceleration
Project	La Brea Tar Pits Museum Transformation Master Plan Project
SF	square feet
S&W	Shannon & Wilson
SPT	Standard Penetration Test
USGS	U.S. Geological Survey
VB&B	Van Beveren & Butelo

1 INTRODUCTION

This report presents our geology and soil discipline study for the proposed La Brea Tar Pits Museum Transformation Master Plan Project (Project). The conclusions and recommendations in this report will be used to support the geology and soil discipline section of the Environmental Impact Report for the Project. A summary of our site reconnaissance, records review, hazards analyses, groundwater review, and recommended measures to mitigate the potential geologic hazards is presented in the following sections. We based our conclusions and recommendations on existing subsurface explorations and laboratory testing performed by us and others in the Project vicinity. We will perform additional subsurface explorations as the Project schedule advances to final design.

The Project is located at 5801 Wilshire Boulevard within the City of Los Angeles (City), as shown in the Vicinity Map, Figure 1, and the Site Plan, Figure 2. The Project consists of proposed improvements in an approximately 13-acre area within the eastern and northwestern portions of Hancock Park. This area includes the exhibits for the La Brea Tar Pits. The site is bounded by the Los Angeles County Museum of Art (LACMA) Campus to the west, Wilshire Boulevard to the south, Sixth Street to the north, and South Curson Avenue to the east.

Based on our review of the existing subsurface explorations performed on or adjacent to the Project site, the subsurface conditions consist of a relatively thin layer of artificial fill overlying alluvial deposits. The alluvial deposits consist of stiff clay and dense tar-bearing sands. The tar-bearing sands are saturated with hydrocarbons, while the upper clay soils contain less hydrocarbons. The presence of the hydrocarbons in the sediments is a result of the Project site being over an oil field.

Hydrogen sulfide and methane gasses generated within the oil field are present in the subsurface. Within the existing subsurface explorations, groundwater was encountered as shallow as 2 feet below ground surface (bgs) at the Project site (Law/Crandall, Inc., 1995), and 1-foot bgs within the LACMA Campus (AECOM, 2019).

Other geologic hazards present on the Project site with potential impacts to the proposed improvements include expansive soils and strong seismic ground shaking. Each of these hazards can be mitigated through the appropriate level of planning and design.

2 PROJECT DESCRIPTION

At the time of this report, we have not been provided with proposed Project design plan sheets. Our understanding of the proposed "Transformation" development is based on:

- Review of the Request for Qualifications/Proposal for the Project dated July 8, 2022;
- Our meeting with you at the Project site on July 19, 2022;
- Review of the provided Master Plan and Concept Design, Volume 1 and 2, prepared by the Project architect Weiss/Manfredi and dated 2021, which includes:
  - "La Brea Tar Pits Master Plan, Preliminary Civil Engineering Narrative," prepared by KPFF dated March 4, 2021, Project No. 1900236
  - "Structural Engineering," prepared by Magnusson Klemencic Associates (MKA) dated 2021; and
- Our previous experience at the Project site and vicinity.

2.1 Site History

Our understanding of the site's history comes from information provided on the Natural History Museums of Los Angeles County's (NHMLAC's) website, from an article published within Environmental & Engineering GeoScience journal titled "Geology of Los Angeles" (Bilodeau and others, 2007), and from our past experience working within the LACMA Campus.

The abundance of tar (or "pitch") at the site was recorded as early as the late 1700s, as noted within diary entries (Bilodeau and others, 2007). The inhabitants of the area would use the available tar as an adhesive and waterproofing material.

In 1828, the Project site was a part of a Mexican land grant called Rancho La Brea. Over time and with the overall growth of Los Angeles, Rancho La Brea was subdivided and developed. In 1902, the Salt Lake Oil Company constructed oil rigs in the general vicinity to extract crude oil from the oil field, and these operations continued through the early 1900s. By the 1920s, the oil field was mostly abandoned in favor of housing and commercial development (Deane and others, 2018).

The first published information with regard to fossils within Rancho La Brea occurred in 1875, and excavation operations to exhume the specimens began in the early 1900s (NHMLAC). Hancock Park was created in 1924 after George A. Hancock, the last owner of Rancho La Brea, donated 23 acres of land to the County of Los Angeles to promote the scientific discoveries exhumed from the tar pits. As part of the land donation, George Hancock stipulated that the fossils exhumed from the park be exhibited (NHMLAC).

The Rancho La Brea Project began in 1969 to gather additional fossil specimens, which were ignored by the earlier excavations, utilizing improved excavation and data gathering techniques (NHMLAC). In 1975, construction began for the George C. Page Museum of La Brea Discoveries (Page Museum), an onsite museum to study and house the fossils. During construction of the Page Museum, fossils were encountered within the building foundation area that were catalogued during the removal process. The Page Museum was opened to the public in 1977 (NHMLAC).

2.2 Existing Site Conditions

We performed a site reconnaissance on August 22, 2022, to review the existing site conditions in the areas of the proposed improvements. We observed the existing conditions of Hancock Park, the exhibits at the La Brea Tar Pits, and the interior of the Page Museum.

Multiple tar pit excavations are located within the park, and natural tar seeps occur randomly throughout the park and the parking lot. The park contains pedestrian pathways, recreational areas, and landscape features. The Page Museum is located within the central-eastern portion of the site. Other features include Lake Pit at the southern portion of the site, an existing at-surface parking lot at the northeastern portion of the site, and a public restroom and comfort station at the southeastern portion of the site. Exhibit 2-1 below shows a tar pit exhibit located within the northwestern portion of Hancock Park.

Exhibit 2-1: A Tar Pit Exhibit Within Hancock Park (View Towards North)

The existing Page Museum is a one-story structure with an accessible roof terrace. Per the "Structural Engineering" sheets prepared by MKA, we understand the structure measures 260 feet in the east-west direction and 230 feet in the north-south direction. On all sides of the structure, the outer 40 feet slopes downward from the upper roof terrace and extends to approximately 6 feet above the first-floor slab at the building perimeter. The sloped section is covered with approximately 12 inches of landscape.

The base of the ground floor is below the surrounding natural grade, embedding the building beneath the surrounding ground surface. The ground floor consists of an atrium within the center, which contains tropical plants and water features, and interior exhibit space housing the La Brea Tar Pit fossils surrounding the atrium. The roof terrace allows visitors to look down into the atrium and provides a view of the surrounding park. Based on the "Structural Engineering" sheets prepared by MKA, we understand the museum's existing foundation consists of a 30-inch-thick reinforced concrete mat slab that covers the entire footprint of the building. The mat slab steps down 4.5 feet withing the interior atrium area. Exhibits 2-2 and 2-3, presented below, show the existing outside and inside condition of the Page Museum.

Exhibit 2-2: Existing Side Slopes Surrounding the Museum (View Towards Northeast)

Exhibit 2-3: Eastern Exhibit Within the Museum (View Towards North)

The Project site is relatively level. The low point is at Lake Pit, where the surrounding grade slopes down towards the lake. The high point is at the Page Museum, in which the structure's slopes extend the grade up to the roof terrace of the building, approximately 15 feet above park grade.

2.3 Proposed Development

We understand the proposed Project involves full renovation and expansion of the existing Page Museum, and construction of new amenities within the surrounding portions of Hancock Park. The new amenities include a looping pedestrian pathway, a pedestrian bridge over Oil Creek, new lookout platforms overlooking excavation pits and tar pit exhibits, and overall transformation of the park experience. The Project will consist of:

- Expanding the Page Museum's gross area from 63,200 square feet (SF) to 104,300 SF. The Project includes seismic strengthening and renovating the existing Page Museum and construction of a one-story expansion towards the northwest.
  - The renovation of the existing structure will include structural demolition and structure modification. The renovation will allow for enlarged exhibition space,

research space, additional storage, retail space, and a ground floor café. The roof terrace will contain new classrooms, multipurpose space, and an outdoor café and bar. As part of the renovation, the existing central atrium will be removed.

- The proposed expansion will include a new lobby and exhibit spaces, two theaters, a mechanical equipment room, administration spaces, research and collections rooms, and loading dock. The expansion is anticipated to be supported on a mat slab foundation with a methane protection layer below the slab. The new and existing mat slab foundations will be connected so the slab deformations and stresses are uniform across the new-to-existing interface.

- A new simple-span bridge crossing over Oil Creek as part of the pedestrian pathway. Oil Creek is a natural spring flowing through the northwestern portion of the site. The abutments of the proposed bridge will be supported on deep foundations.
- Three new biofiltration systems to manage stormwater for the Project:
  - A 10,100 SF in-ground biofiltration planter within the southeastern portion of the site, east of Lake Pit.
  - A 6,400 SF biofiltration planter within the northeastern portion of the site, north of the Page Museum. The planter would be excavated approximately 4 to 5 feet and lined with an impermeable liner. The planter will then be filled with gravel subdrainage and a perforated pipe, amended soil, and plants. Supporting wall structures will likely be required underground to separate the compacted soil supporting traffic loading and the uncompacted biofiltration media.
  - Refurbishing Oil Creek as a bioswale within the northwestern portion of the site. The existing creek drainage will be cleared, lined with an impermeable liner, and then partially filled with gravel subdrainage and a perforated pipe, amended soil, and plants.
- New entry pavilions and canopies, located at:
  - Wilshire Gateway Entrance, at the corner of Wilshire Boulevard and South Curson Avenue.
  - Sixth Street Entrance, at the northwestern corner of the site.
  - Pit 91 Outdoor Classroom and Canopy. The proposed improvements include demolishing the existing viewing station and constructing a shaded outdoor classroom with canopy.

  Currently, the columns and walls for the pavilions and canopies are anticipated to be supported on a mat slab foundation. A methane protection layer will be installed below the mat slab.
- A new school bus drop-off zone on South Curson Avenue. The drop-off one will be approximately 215 to 230 feet long to accommodate school buses.
- Reconfiguration of the existing parking lot. The existing parking lot will be moved from its current position towards the north by approximately 50 to 70 feet, along the

boundary of West 6th Street. The parking lot will be expanded from 63,000 SF to 65,000 SF.

- Landscaped paths to provide connection between the Tar Pits and LACMA. The proposed improvements will reconfigure the existing pedestrian pathways into a continuous paved pedestrian pathway, linking the disparate existing elements of the site.

3 PREVIOUS STUDIES

We reviewed the geotechnical reports previously prepared for improvements in the Project area, the LACMA Campus, and the Purple Line Subway Extension by the Los Angeles County Metropolitan Transportation Authority (LA Metro). These include reports prepared by Shannon & Wilson (S&W) and our predecessor company, Van Beveren & Butelo (VB&B). Below is a list of projects reviewed, organized by geotechnical companies (including predecessor companies) and LA Metro.

The geologic hazards and recommendations are based on the results of our prior subsurface explorations and explorations by others listed below. Relevant boring logs prepared by S&W and VB&B are presented in Appendix A. Relevant boring logs prepared by others are presented in Appendix B.

3.1 Shannon & Wilson/Van Beveren & Butelo

- The Academy Museum of Motion Pictures (AMMP):
  - Geology and Soil Discipline Report (S&W, 2014a)
  - Geotechnical Design Reports (S&W, 2014b and 2015)
  - Construction Summary Report (S&W, 2018)
- Broad Contemporary Art Museum (BCAM) and Subterranean Garage:
  - Geotechnical Design Memo, Preliminary Findings (VB&B, 2004a)
  - Geotechnical Design Memo No. 2, Preliminary Recommendations for Temporary Dewatering System and Uplift Load Resistance (VB&B, 2004b)
  - Geotechnical Investigation Report (VB&B, 2005b) and follow up City Response Letters based on City of LA review comments and questions (VB&B, 2005d and 2005e)
  - Depth to Groundwater Memo (VB&B, 2005c)
  - Disposal of Site Runoff into Soils Letter (VB&B, 2006b)
  - Grading Over Tar Seep Letter (VB&B, 2007)
  - Interim and Final Construction Observation Reports (VB&B, 2006a and 2008a)

  - Geotechnical Investigation Report for Phase 2 of Project (VB&B, 2008b)
  - Final Construction Observation Report (S&W, 2010)
- Preliminary Findings and Conclusions, Sidewalk Heaving, 5801 West 6th Street (VB&B, 2005a)

3.2 AECOM/URS

- AECOM, Final Report for Geotechnical Investigation, LACMA Building for Permanent Collection (BPC) (AECOM, 2019)
- URS, Preliminary Geotechnical Recommendations for Proposed Broad Contemporary Art Museum (URS, 2003)
- URS, Preliminary Report, Geotechnical Evaluations for Proposed Museum Replacement Project (URS, 2002)

3.3 Los Angeles County Metropolitan Transportation Authority

- Los Angeles County Metropolitan Transportation Authority (LA Metro), Geotechnical Data Report - Tunnel Reach 2, Westside Subway Extension Project, Section 1 (LA Metro, 2014)
- Converse Consultants, Inc., Interim Geotechnical Report for Metro Project, Design Unit A250 (Converse, 1984)

3.4 Law/Crandall, Inc./LeRoy Crandall and Associates

- Law/Crandall, Inc., Geotechnical Investigation Reports for Proposed Additions to Hancock Park (Law/Crandall, 1995 and 1998)
- LeRoy Crandall and Associates (LCA):
  - Foundation Investigation for Proposed Additions at 5905 Wilshire Boulevard (LCA, 1982)
  - Completion of Exploration Program for Proposed Additions (LCA, 1984)

4 REGULATORY FRAMEWORK

This section provides an introduction to applicable federal, state, and local regulations and codes that will govern the Project development.

4.1 Federal Level

There are no specific federal regulations addressing geology and soils issues that are not addressed by the state or local requirements.

4.2 State Level

4.2.1 California Building Code

The State of California adopted the 2019 California Building Code (CBC), Volumes 1 and 2, which went into effect on January 1, 2020. Based in part on the 2018 International Building Code (IBC), the 2019 CBC makes up Part 2 of Title 24 of the California Code of Regulations. In Chapter 16 of Volume 2, the code contains provisions for structural design, including soil lateral loads (Section 1610) and earthquake loads (Section 1613). Provisions for soils and foundations include:

- Geotechnical explorations (Section 1803),
- Excavation, grading and fill (Section 1804), and
- Foundations (Sections 1808-1810).

Appendix J of the CBC applies to grading.

4.2.2 Seismic Hazard Regulations

The Alquist-Priolo Geologic Hazard Zones Act was passed by the State of California in 1972 to address the hazard and damage caused by surface fault rupture during an earthquake. The Act was renamed the Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act), effective January 1, 1994. The Alquist-Priolo Act has since been revised 12 times; most recently a version became available in 2018 (California Geological Survey [CGS], 2018a). The Alquist-Priolo Act requires the State Geologist to establish "earthquake fault zones" along known active faults (faults that have moved in the last ~11,000 years) in the state. Cities and counties with earthquake fault zones are required to regulate development projects within these zones.

The State Seismic Safety Commission was established by the Seismic Safety Act in 1975 with the intent of providing oversight, review, and recommendations to the Governor and State Legislature, as well as state and local governments regarding seismic issues. The commission was renamed the Alfred E. Alquist Seismic Safety Commission in 2006.

The Seismic Hazard Mapping Act of 1990 was enacted, in part, to address seismic hazards not included in the Alquist-Priolo Act, including strong ground shaking, liquefaction, landslides, and/or other seismic related ground failures. Under this Act, the State Geologist is assigned the responsibility of identifying and mapping seismic hazard zones. The recommended guidelines and criteria for the preparation of seismic hazard zones are presented in Special Publication 118, “Recommended Criteria for Delineating Seismic Hazard Zones in California” (CGS, 2004). The CGS, formerly the State of California,

Division of Mines and Geology (CDMG), adopted seismic design provisions in Special Publication 117A, "Guidelines for Evaluating and Mitigating Seismic Hazards in California" (revised and readopted on September 11, 2008) (CGS, 2008) and Special Publication 118.

Additional guidelines published by the CGS/CDMG for evaluating geologic and seismic hazards with respect to a project development include the following:

- CGS Special Publication 42, "Earthquake Fault Zones, A Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California" (CGS, 2018a)
- CGS Note 49, "Guidelines for Evaluating the Hazard of Surface Fault Rupture" (CGS, 2002)

4.3 Local Level

4.3.1 City of Los Angeles

The Project site is located within the City. However, the site is owned by the County of Los Angeles (County). As such, we understand the proposed Project is subject to the regulatory controls of the County. The recommendations provided below and future design recommendations which will be developed as the Project progresses follow the County requirements.

4.3.2 County of Los Angeles

4.3.2.1 Los Angeles County Building Code

The County adopted portions of the 2019 CBC and 2018 IBC together with a series of County amendments as the 2020 County of Los Angeles Building Code (CLABC), Volumes 1 and 2. The 2020 CLABC amendments were published on January 1, 2020. Together, the provisions in Volumes 1 and 2 of the CLABC address issues related to:

- Site grading,
- Cut and fill slope design,
- Soil expansion,
- Geotechnical studies before and during construction,
- Slope stability,
- Allowable bearing pressures and settlement below footings,
- Effects of adjacent slopes on foundations,
- Retaining and basement walls, and

- Shoring of adjacent properties.

Appendix J of the CLABC addresses grading and excavation requirements.

The County of Los Angeles Department of Public Works Building and Safety (Building and Safety) is responsible for implementing the provisions of the CLABC and grading standards. Building and Safety has jurisdiction over projects to be approved by the County where grading is required, to ensure Project design follows County regulations, to ensure the safety of the workers during construction, and to ensure the safety of the public once construction is complete.

4.3.2.2 Los Angeles County General Plan

The County General Plan is the County's guide for long-term development and conservation. The General Plan provides the policy framework for future development by establishing goals, policies, and programs adopted by the County. The newest edition of the General Plan was adopted by the Board of Supervisors on October 6, 2015. The current General Plan is applicable for development through 2035.

Chapter 12 consists of the Safety Element of the County General Plan. The purpose of the Safety Element is to reduce potential risks to both people and property within the County from seismic and geotechnical hazards, as well other hazards which will not be covered in this report. Seismic and geotechnical hazards are addressed within Goal S 1 of the Safety Element, which consists of four policies identified as Policy S 1.1 through Policy S 1.4.

Potential seismic hazards identified consist of surface fault (ground) rupture, liquefaction, earthquake-induced landslides, and coastal flooding generated from tsunamis. These seismic hazards could result in damage to infrastructure with secondary impacts including fire, flooding, and release of dangerous materials. The County General Plan requires new projects located in Alquist-Priolo Earthquake Fault Zones and other seismic hazard mapping zones produced by the state to have a geotechnical study to evaluate these hazards.

Potential geotechnical hazards identified consist of hillside hazards such as mud and debris flows, active deep-seated landslides, hillside erosion, and man-induced slope instability. Other geotechnical hazards identified include erosion or undercutting of slopes, and natural or artificial compaction of unstable ground.

In addition to the Safety Element, the General Plan consists of Hillside Management Areas Ordinance and Hillside Design Guidelines. The Ordinance and Guidelines regulate development in areas with 25% or greater natural slope inclinations, providing applicable

design techniques, and an evaluation of potential hazards to address hillside geotechnical hazards.

5 ENVIRONMENTAL SETTING

5.1 Regional Geology

The Project site is located in the coastal Los Angeles Basin of southern California. The basin includes the low-lying area between the San Gabriel Mountains and the Pacific Ocean shoreline. Nearby hills and mountain ranges bordering the basin include the prominent Santa Monica Mountains to the north, the Hollywood Hills to the northeast, the Elysian and Repetto Hills to the east, the Peninsular Ranges to the southeast, and the Baldwin Hills to the south.

The Project site occupies the westerly extent of the La Brea Plain. The La Brea Plain is a broad, slightly elevated, and dissected surface underlain by coalescing Quaternary age (recent to 2.6 million years ago) alluvial fan and flood plain deposits. These alluvial sediments were deposited on the underlying Tertiary-age (2.6 to 66 million years ago) shallow marine sedimentary bedrock formations. Faulting and folding of the bedrock over millions of years has formed structural traps for petroleum deposits. Several oil and gas fields were developed within this portion of the Los Angeles Basin, including the Salt Lake and South Salt Lake fields.

At the Project site, crude oil and gas leaking from the petroleum deposits of the Salt Lake Field have migrated towards the ground surface through fractures and faults in the bedrock, permeating into the overlying alluvium. Upon reaching shallower depths, the lighter petroleum components are altered by evaporation and biologic processes resulting in a more viscous remnant tar (or asphalt) deposit.

5.2 Local Geology and Geologic Units

5.2.1 General

Regional geologic maps indicate the Project site is underlain by alluvial deposits, as shown on the Regional Geology Map, Figure 3 (Dibblee and Ehrenspeck, 1991). Specifically, the geologic map depicts the Project site being underlain by slightly elevated and dissected, older alluvium and alluvial fan sediments (mapped as Qae). Geotechnical explorations near the Project site indicate much of the alluvial deposits are covered by a layer of artificial fill. The subsurface conditions are described in more detail below.

5.2.2 Artificial Fill

Most of the subsurface explorations performed at the Project site encountered artificial fills extending to depths of approximately 1 to 8 feet bgs (Law/Crandall, 1995 and 1998). The fill is of variable composition, consisting of silty clay, sandy clay, clayey silt, and silty sand.

5.2.3 Alluvium

The Project site is underlain by units described as late-Pleistocene to Holocene (recent to about 11,000 years old) in age. The Pleistocene-age (about 11,000 to 1.8 million years) alluvial deposits consist of stiff to very stiff clays with some dense silt and silty sand layers. These relatively fine-grained materials overlie thicker deposits of dense to very dense sand. The fine-grained alluvial deposits belong to the Lakewood Formation, while the deeper sand beds correspond to the San Pedro Formation (California Department of Water Recourses [DWR], 1961). The youngest surficial deposits observed in this area are Holocene sediments of modern alluvial fans, stream channels (e.g., Los Angeles and San Gabriel Rivers), and their flood plains. These debris-flow, sheetflood, and fluvial deposits consist of boulder, cobble, and pebble gravel lenses and sheets, interbedded with sand, silt, and clay derived from the surrounding highlands (Bilodeau and others, 2007).

As noted previously, natural hydrocarbons are present in the alluvium due to the upward migration of crude oil leaking from oil deposits within the underlying bedrock. The crude oil has been altered near the ground surface to viscous tar, and the more permeable sand deposits are permeated with tar (Deane and others, 2018).

5.2.4 Bedrock

The Lakewood and San Pedro Formations are directly underlain by Tertiary-age sedimentary bedrock of the Fernando Formation. The bedrock consists primarily of well stratified, locally folded, interbedded claystone, siltstone, and sandstone (Converse, 1984). Borings from the adjacent LA Metro Westside Subway Extension project encountered Fernando Formation, consisting of primarily siltstone, beginning at depths of approximately 65 feet to 120 feet bgs (LA Metro, 2014). From the LACMA Building for Permanent Collection (BPC) project, Borings B-15-2 and B-15-3 did not encounter the Fernando Formation to a total depth explored of approximately 88 feet for both explorations. Boring B-15-4 encountered the Fernando Formation at an approximate depth of 94 feet bgs (AECOM, 2019).

5.3 Tar Sands and Seeps

The depth to tar sand is anticipated to vary throughout the Project site. AECOM subsurface explorations encountered tar sands at depths of approximately 13 feet to 20 feet bgs,

correlating to elevations of 151 feet to 156 feet (AECOM, 2019). The URS subsurface explorations encountered tar sands at depths of approximately 13 to 23 feet below grade, correlating to elevations of 142 feet to 157 feet (URS, 2002 and 2003). The LA Metro subsurface explorations showed more variability, with the subsurface explorations encountering tar sands at depths of approximately 6 feet to 30 feet bgs, correlating to elevations of 137 feet to 180 feet (LA Metro, 2014).

The subsurface explorations performed by AECOM indicated the tar content within the San Pedro Formation varied between approximately 11% and 18% within the collected soil samples (AECOM, 2019). The LA Metro subsurface explorations indicated the tar content within the San Pedro Formation varied between approximately 10% and 20% within the collected soil samples, though two samples collected (one within a gravel layer, and one within a sand with silt and gravel layer) resulted in tar contents of 2% and 4% (LA Metro, 2014).

Based on our previous experience at the LACMA Campus, we anticipate soil excavated above the groundwater likely would not contain significant natural oil or tar. As such, it likely could be disposed of as non-impacted soil. Spoils from excavations that extend below the groundwater could contain natural oil or tar. Excavation spoils will likely require chemical analyses for offsite disposal. In addition, the proposed deep foundations will likely penetrate the tar-impacted sands. Impacts from excavating the foundations into the tar sands will depend on the deep foundation system used, but likely will include drilling spoils generated from installation.

Tar seeps are locally found around the Project site. We understand the tar seeps occur randomly and are likely the result of methane and hydrogen sulfide gas pressure at depth mobilizing groundwater and tar to the surface. Where tar seeps occur below existing and proposed structures, barriers and ventilation should be designed in accordance with the Project methane specialist. Where tar seeps occur in landscaping or exterior portions of the park, temporary barriers should be installed until the gas driving the tar seeps dissipates.

5.4 Groundwater

The Project site is located within the Central Groundwater Basin of the Los Angeles Coastal Plain (DWR, 2004). The principal freshwater-bearing sediments of the Central Basin include the Holocene-age alluvial deposits, and the Pleistocene-age Lakewood and San Pedro Formations at depth (DWR, 1961).

According to the Seismic Hazard Zone Report for the Hollywood 7.5-Minute Quadrangle, the Project site lies within the 10-foot water level contour of the historically high groundwater levels, as shown in Figure 4 (CDMG, 1998). This indicates that the historical

high groundwater depth is at or shallower than 10 feet bgs. The previous subsurface explorations encountered groundwater levels at depths less than 10 feet bgs. Exhibit 5-1, shown below, presents groundwater depths encountered within exploration borings at or adjacent to the Project site. Groundwater depth is anticipated to fluctuate in response to rainfall, seasonal variations, and other factors, and is anticipated to vary throughout the site.

Exhibit 5-1: Groundwater Level Measurements in Existing Borings

Boring ID	Date of Exploration	GW Depth Measurement (feet)	Approximate GW Elevation (feet)
VBB-2005-B-4	October 4, 2004	6.6 [1]	164.4
VBB-2005-B-5	October 5, 2004	5.5 [2]	164.6
AECOM-B-15-3	November 2-3, 2015	30	138.5
AMC-2014-G-121	May 16-18, 2011	14	163
AMC-2014-M-108	May 2-3, 2011	35	154
URS-2003-B-8	October 15, 2003	18 [3]	147
URS-2002-B-1	July 17, 2002	50	120
URS-2002-B-2	July 24, 2002	22	148
L/C-1998-B-5	January 7, 1998	4 [4]	167
L/C-1998-B-7	January 7, 1998	6 [5]	172
L/C-1998-B-9	January 6, 1998	5.5 [4]	178.5
L/C-1995-B-1	January 26, 1995	1 [5]	- [6]
L/C-1995-B-2	January 23, 1995	4.5	- [6]
L/C-1995-B-3	January 23, 1995	7	- [6]
L/C-1995-B-5	January 24, 1995	4	- [6]
L/C-1995-B-7	January 24, 1995	6	- [6]
L/C-1995-B-8	January 26, 1995	2	- [6]
L/C-1995-B-9	January 27, 1995	2.5 [5]	- [6]
LCA-1984-B-4	April 12, 1984	4 [7]	164.3
LCA-1982-B-1	December 14, 1981	6.5 [8]	163.5
LCA-1982-B-3	December 15, 1981	6.5 [9]	159.2

NOTES:

1 Groundwater measurement made 15 days after completion of drilling.
2 Groundwater measurement made 14 days after completion of drilling.
3 Groundwater encountered identified as being perched groundwater.
4 Groundwater encountered noted as "Water seepage" in boring log.
5 Groundwater encountered noted as "Slight water seepage" in boring log.
6 Ground surface elevation not listed on boring log.
7 Groundwater measurement made 12 days after completion of drilling.
8 Groundwater measurement made 3 days after completion of drilling.
9 Groundwater measurement made 2 days after completion of drilling.

In addition, AECOM (2019) converted Borings B-15-3 and B-15-4 into groundwater monitoring wells. Groundwater level data was collected at Boring B-15-3 for over two years and collected at Boring B-15-4 for approximately a year and a half. Over that time, the shallowest groundwater depth encountered was approximately 1-foot bgs within Boring B-15-3 (corresponding to an elevation of approximately 167.5 feet) and approximately 5.7 feet within Boring B-15-4 (corresponding to an elevation of 164 feet).

Per the "Civil Engineering" sheets prepared by KPFF, substantial groundwater intrusion has occurred within the lowest level of the existing Page Museum. The "Structural Engineering" sheets prepared by MKA presents a list of locations within the existing Page Museum where water infiltration was observed by members of the design team.

Tar occurs within the groundwater as observed at Lake Pit, and tar seeps occur randomly throughout the site. Both of these indicate the potential for near-surface groundwater and tar to be encountered. AECOM (2019) stated that tar was observed in the groundwater for the LACMA site, which can lead to a negative effect on the efficiency of dewatering and water disposal systems. As such, AECOM recommended additional considerations for the dewatering well development and well/pump operation and maintenance (AECOM, 2019).

5.5 Faulting and Seismicity

5.5.1 Faulting

The Project site is located within the seismically active southern California area and is expected to experience the effects of future earthquakes on active faults. Figure 5, Regional Fault Map, illustrates active and potentially active faults mapped in the vicinity of the Project site.

Active faults are those that have moved during the Holocene Age. Potentially active faults are those faults that display latest movement during Quaternary geologic time, where Holocene activity cannot be demonstrated. The Quaternary time includes the Holocene and Pleistocene Epochs and represents the last 2.6 million years of geologic time. Potentially active faults are not considered an imminent fault rupture hazard, but the potential cannot be completely dismissed. Inactive faults are those faults where the latest displacement is older than the Pleistocene and are not considered a surface rupture hazard.

Exhibits 5-2 and 5-3, shown below, provide a list of significant active or potentially active faults, respectfully, which are capable of generating strong seismic ground shaking at the Project site. This list does not encompass all active or potentially active faults within southern California. The Los Angeles Basin, and the southern California region as a whole, is located within a complex zone of faults, fault systems, folds, and other geologic features.

Exhibit 5-2: Major Faults Considered to Be Active in Southern California

Fault	MCE M_w [1]	Fault Type [2]	Slip Rate (mm/yr) [2]	Approximate Distance from Project Site (miles) [3]	Direction from Project Site
Elysian Park - Lower Thrust	Unspecified	T	1.0 - 5.0	1.7	SE
Hollywood	6.7	R	1.0 - 5.0 (1.5)	2.3 (2.6)	N
Newport-Inglewood-Rose Canyon Fault Zone	7.5	SS	1.0 - 5.0	2.8 (1.7)	SW
Santa Monica	7.4	R	1.0 - 5.0 (1.5)	3.5 (2.4)	W
Elysian Park - Upper Fault	6.7	R	0.2 - 1.0	4.2	E
Raymond	6.8	SS	1.0 - 5.0 (0.8)	8.8 (7.1)	NE
Verdugo	6.9	R	0.2 - 1.0	9.1	NE
Sierra Madre Fault Zone - Sierra Madre Section	7.3	R	1.0 - 5.0 (4.0)	14 (14)	NE
Sierra Madre Fault Zone – San Fernando Section	6.7	T	1.0 - 5.0 (3.0)	14 (14)	N
Northridge	6.9	T	1.0 - 5.0	17	N-NW
Elsinore Fault Zone – Whittier Section	7.0	SS	1.0 - 5.0 (3.5)	18 (21)	SE
Sierra Madre Fault Zone – Santa Susana Section	7.2	R	> 5.0 (7.0)	19 (19)	N-NW
Oak Ridge	7.2	R	Unspecified	32 (38)	NW
San Andreas Fault Zone – Mojave Section	7.5	SS	> 5.0 (20 - 40)	36 (36)	NE
Elsinore Fault Zone – Chino Section	6.9	R	1.0 - 5.0 (2.0)	38 (38)	SE
San Jacinto Fault Zone – San Bernardino Valley Section	7.1	SS	> 5.0 (18)	51 (48)	E

NOTES:

1 Information for the MCE Mw was provided from the U.S. Geological Survey (USGS) 2008 National Seismic Hazards Map - Fault Database. Note that the USGS 2014 Fault Database does not include California faults at the time of this report preparation.

2 Information for fault type and slip rate was provided from the USGS 2014 National Seismic Hazards Map - Interactive Fault Map for Quaternary Fault and Fold Database. For slip rate, the provided range is considered the slip rate category. The value in the parenthesis is the maximum assigned slip rate value from Peterson and others (1996) for probabilistic seismic hazard assessment for the State of California, with exception to the San Andreas Fault Zone in which the value in the parenthesis is based on Weldon and others (2002).

3 Distances between Project site and faults are approximate. They were determined using the USGS 2014 National Seismic Hazards Maps - Fault Source Map. Distance values in parenthesis were determined using the California Geological Survey's interactive online map, Earthquake Zones of Required Investigation.

MCE M_w = Maximum Considered Earthquake moment magnitude; R = reverse; SS = strike slip; T = thrust

Exhibit 5-3: Major Faults Considered to Be Potentially Active in Southern California

Fault	MCE M_w [1]	Fault Type [2]	Slip Rate (mm/yr) [2]	Approximate Distance from Project Site (miles) [3]	Direction from Project Site
Overland Avenue	Unspecified	Unspecified	Unspecified	4.2	SW
Charnock	Unspecified	Unspecified	Unspecified	6.0	SW
Los Alamitos	Unspecified	Unspecified	Unspecified	20	SE
San Jose	6.7	R	0.2 - 1.0	27	E

NOTES:

1 Information for the maximum considered earthquake moment magnitude was provided from the U.S. Geological Survey (USGS) 2008 National Seismic Hazards Map - Fault Database. Note that the USGS 2014 Fault Database does not include California faults at the time of this report preparation.

2 Information for fault type and slip rate was provided from the USGS 2014 National Seismic Hazards Map - Interactive Fault Map for Quaternary Fault and Fold Database. For slip rate, the provided range is considered the slip rate category. The value in the parenthesis is the maximum assigned slip rate value from Peterson and others (1996) for probabilistic seismic hazard assessment for the State of California.

3 Distances between Project site and faults are approximate. They were determined using the USGS 2014 National Seismic Hazards Maps - Fault Source Map.

MCE M_w = Maximum Considered Earthquake moment magnitude; R = reverse; SS = strike slip; T = thrust

The following sections provide a discussion of nearby active faults to the Project site.

The Santa Monica and Hollywood faults are located at the southern base of the Hollywood Hills. The faults are considered to be a part of the larger Malibu-Santa Monica-Hollywood-Raymond fault zone, which extends from Malibu to Pasadena. The Santa Monica fault is a strike-slip, oblique/left-reverse fault, which has a slip rate of approximately 0.5 to 1.5 millimeters (mm) per year and is predicted to be capable of generating a 6.5 to 7.4 moment magnitude (M_w) earthquake (U.S. Geological Survey [USGS] 2008 National Seismic Hazard Maps; Petersen and others, 1996). The Hollywood fault is a sinistral-reverse oblique fault which has a slip rate of approximately 0.5 to 1.5 mm per year and is predicted to be capable of generating a 6.5 to 6.7 M_w earthquake (USGS 2008 National Seismic Hazard Maps; Petersen and others, 1996). Neither fault has generated a major earthquake in historic times.

The Newport-Inglewood Fault is a right-lateral, strike-slip fault. The fault extends from Culver City southeast to Newport Beach, at which point it runs out into the Pacific Ocean and joins with the Rose Canyon fault offshore of San Diego, creating the Newport-Inglewood-Rose Canyon fault system. The fault has a slip rate of approximately 1 mm per year and is predicted to be capable of producing a 6.5 to 7.5 M_w earthquake (USGS 2008 and 2014 National Seismic Hazard Maps). The 1933 Long Beach Earthquake was generated by this fault.

The Elysian Park fold and thrust belt includes a blind fault (i.e., a buried fault that does not extend to the surface) capped by a fold and thrust structure. The axial trend of the fold extends through the Elysian Park-Repetto Hills from about Silver Lake on the west to

Whittier Narrows on the east. The 1987 Whittier Narrows earthquake (magnitude 5.9) has been attributed to subsurface thrust faults, which are reflected at the earth's surface by a west-northwest trending anticline known as the Elysian Park anticline, or the Elysian Park fold and thrust belt. The subsurface faults that create the structure are not exposed at the surface. However, as demonstrated by the 1987 earthquake and two smaller earthquakes on June 12, 1989, the faults are a source for future seismic activity.

The Oak Ridge fault is a blind thrust fault located beneath the Santa Susana Mountains. The Northridge thrust fault is an inferred blind thrust fault that is considered the western extension of the Oak Ridge fault, and is associated with generating the January 17, 1994, Northridge Earthquake. The Northridge thrust is located beneath the majority of the San Fernando Valley. This thrust fault is not exposed at the surface. The Northridge thrust is an active feature that can generate future earthquakes.

5.5.2 Recent Seismicity

Several earthquakes of moderate to large magnitude (greater than 5.0) have occurred in southern California area within the last 90 years. A list of some of these earthquakes (with magnitudes greater than 5.7) within approximately 150 miles of the site is included in Exhibit 5-4 below.

Exhibit 5-4: Major Historic Earthquakes in Southern California

Earthquake	Date of Earthquake	Moment Magnitude Scale (M_w)	Distance to Epicenter (miles)	Direction to Epicenter
Long Beach	March 10, 1933	6.4	38	SE
Kern County	July 21, 1952	7.5	75	N-NW
Borrego Mountain	April 9, 1968	6.5	143	SE
San Fernando	February 9, 1971	6.5	24	N
Whittier Narrows	October 1, 1987	5.9	16	E
Superstition Hills	November 24, 1987	6.6	162	SE
Sierra Madre	June 28, 1991	5.8	24	NE
Joshua Tree	April 22, 1992	6.1	117	E
Big Bear	June 28, 1992	6.4	88	E
Landers	June 28, 1992	7.3	110	E
Northridge	January 17, 1994	6.7	15	NW
Hector Mine	October 16, 1999	7.1	125	NE
Ridgecrest Sequence	July 4-5, 2019	6.4, 7.1	123, 125	NE

NOTES:

1 Information provided by the Southern California Earthquake Data Center (SCEDC).

2 Distances to epicenter values were determined based on the latitude and longitude values presented by SCEDC.

5.6 Oil Field and Adjacent Oil Wells

According to maps prepared by the State of California Department of Conservation, Geologic Energy Management Division (CalGEM; formerly known as Division of Oil, Gas and Geothermal Resources [DOGGR]), the site is located within the Salt Lake Oil Field (CalGEM, 2022), as shown in Figure 6. The closest oil and gas wells include:

- Chevron Salt Lake 38 to the north
- Chevron Salt Lake 32 to the north
- Chevron Salt Lake 406 to the east
- Mars Oil Co. Masselin 1 to the south

According to CalGEM records, these wells are plugged and abandoned. The CalGEM maps do not show abandoned or active oil wells within the footprint of the Project site. However, the CalGEM well locations are approximate and location errors may be possible. Although the likelihood of encountering an abandoned oil well is low, mitigation or abandonment would be required if a well was found under proposed improvements.

5.7 Methane and Hydrogen Sulfide Gas

The Project site is located within an area of known shallow methane and hydrogen sulfide gas accumulation. Crude oil and methane gas leak out from the petroleum deposits and migrate through fractures and faults located within the bedrock until encountering the alluvial soils, where it permeates into the alluvium and continues to travel upwards to the ground surface. Many of the light petroleum components are lost to evaporation and biogenic processes, resulting in viscous tar seeping out of the ground surface (Deane and others, 2018).

Information and design to mitigate the gassy ground conditions will be developed during final design of the Project. We understand a methane specialist will be developing the ventilation system and barriers to reduce gas seepage into enclosed structures.

6 HAZARDS ANALYSIS

6.1 General

This section provides an evaluation for potential adverse environmental impacts associated with potential geologic hazards for the proposed development. Specific potential adverse impacts applicable for the Project are strong seismic ground shaking, expansive soils, and gas. With the exception of methane gas, these potential impacts, along with other potential geologic hazards in the area, are described in the following sections.

6.2 Methodology

Our geotechnical study for the proposed improvements and our evaluation of potential effects and potential design measures is based on available published information and existing subsurface explorations and laboratory testing performed by us or others in the Project vicinity. S&W has extensive experience in the site vicinity, which we have utilized for our hazards analysis.

The potential impacts discussed in the following subsections is based on the general environmental setting of the Project site, discussed above, and is based on potential seismic or geotechnical hazards discussed within the Safety Element of the County General Plan.

6.3 Potential Geology and Soils Hazards and Project Design Recommendations

6.3.1 Seismic Hazards

As discussed above, the Project site is located within the seismically active southern California area and is expected to experience the effects of future earthquakes on active faults. Seismic hazards include surface fault rupture, strong seismic ground motion, and seismically induced settlement due to liquefaction.

6.3.1.1 Surface Fault Rupture

Our surface fault rupture hazard evaluation is based on criteria developed by the CGS for the Alquist-Priolo Act program. In accordance with the act, an active fault is one that has ruptured within the Holocene geologic time.

Based on the "Earthquake Zones of Required Investigation" map for the Hollywood Quadrangle (CGS, 2014), the Project Site does not lie within an Alquist-Priolo Earthquake Fault Zone (AP Zone), as shown in Figure 7, Seismic Hazard Zones Map. The nearest AP Zones are the Newport-Inglewood-Rose Canyon Fault Zone, located approximately 1.6 miles southwest of the site, and the Hollywood Fault Zone, located approximately 2.2 miles north-northwest of the site (CGS, 2014 and 2018b).

The trace of the Sixth Street Fault is projected through the south to southwest portion of Project site (Converse, 1984). The Sixth Street Fault is a near-vertical fault, with north side movement up relative to the south side. The near-surface location of the fault is not well defined, nor is the fault listed as an active or potentially active by the CGS. Therefore, it is not included in the AP Zone maps. The fault likely does not penetrate the Lakewood Formation or the San Pedro Formation (Converse, 1984). The location of the fault is inferred based on the projection of data related to the Salt Lake Oil Field. The fault likely acts as a barrier for gas and oil migration.

6.3.1.2 Seismic Ground Shaking

We anticipate the site will experience strong ground shaking during an earthquake generated from faults in the region. The intensity of earthquake motion and seismic hazards that may impact the Project site will depend on the characteristics of the generating fault, distance to the earthquake fault, earthquake magnitude, earthquake duration, and site-specific geologic conditions. Likely sources for strong ground motion are known active faults or potentially active faults. Ground motions may be amplified or attenuated at the site depending on the level of ground shaking in the underlying bedrock, underlying soil type, depth to bedrock, and other factors. Discussion towards applicable building code

requirements to address potential strong ground shaking during an earthquake is provided below.

6.3.1.3 Liquefaction

Soil liquefaction is a phenomenon in which pore pressure in loose, saturated, granular soil increases during ground shaking to a level near the initial effective stress, resulting in a reduction of shear strength of the soil (i.e., quicksand like conditions). The loss in shear strength may generate ground settlement, lateral spreading (ground movement on gentle slopes), bearing capacity failure, and/or landslides. Liquefaction potential is greatest where loose granular soil (sand and non-plastic silt) is present below groundwater and is more likely to affect structures when it occurs at depths shallower than 50 feet. Liquefaction potential decreases as the fines (clay and silt content of soil) increases, and the liquefaction potential increases as ground shaking increases.

The seismic hazard zone map for the Hollywood Quadrangle includes liquefaction hazard zones for the quadrangle (CGS, 2014). The site is not mapped within a liquefaction hazard zone.

The geologic materials underlying the Project site generally consist of stiff cohesive (fine-grained) soil underlain by dense to very dense tar sand. Our previous explorations completed for the AMMP did encounter thin zones of loose silty sand that have a potential for liquefaction; however, the zones were discontinuous and localized. Furthermore, other previous explorations performed within the site vicinity did not encounter potentially liquefiable soil.

Based on the stiff and dense nature of the onsite subsurface materials, the potential for liquefaction to impact the proposed development is low.

6.3.1.4 Recommendations

Potential impacts associated with strong seismic ground shaking are anticipated for the proposed development. Implementation of the Project could expose the proposed development and people to strong seismic ground shaking, which represents a potentially significant adverse impact. However, these effects are not unique to the Project site as the general vicinity sits within a seismically active region.

The proposed improvements should be designed in accordance with the 2020 CLABC, which calls for consideration of seismic loading factors. Specifically, Section 1613 provides discussion towards earthquake loads and towards development of seismic ground motion design values. Per Section 1613, structures “shall be designed and constructed to resist the effects of earthquake motions in accordance with Chapters 11, 12, 13, 15, 17 and 18 of

ASCE 7, as applicable. The seismic design category for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7." ASCE 7 refers to "Minimum Design Loads and Associated Criteria for Buildings and Other Structures", prepared by the American Society of Civil Engineers and the Structural Engineering Institute. Adherence to the code will address the potential hazards associated with strong seismic ground shaking. No additional measures are required to address potential hazards associated with surface fault rupture, strong seismic ground shaking, or seismic-related ground failure such as liquefaction.

For preliminary design purposes, ground motion design parameters are provided herein. These values will need to be confirmed within the geotechnical design report. The ground motion design parameters are in accordance with the 2019 CBC and were determined using web-based tools. We characterized the site using Standard Penetration Test (SPT) N-values noted within the exploration logs. Based on an average SPT N-value for the upper 100 feet of the soil profile, we recommend the site be characterized as Site Class D.

The 2019 CBC design criteria considers a maximum considered earthquake (MCE) hazard as a seismic event with a 2% probability of exceedance in 50 years, i.e., a 2,475-year return period, with a deterministic maximum cap in some regions. For seismic design of structures in accordance with the CBC, the design spectral accelerations peak ground acceleration (PGA), S_S, and S_1 are required. We obtained these values and the site soil response factors (F_{PGA}, F_a, and F_v) using the web-based interactive Seismic Design Maps tool developed by the Structural Engineers Association of California and California's Office of Statewide Health and Planning Development, following ASCE 7-16 design reference.

The spectral accelerations PGA, S_S, and S_1 are determined assuming Site Class B conditions, and then adjusted for Site Class D using the site soil response factors to determine the MCE parameters adjusted for site class effects (PGA_M, S_{MS}, and S_{M1}). The design-based values (S_{DS} and S_{D1}) are then determined by multiplying the site adjusted MCE parameters by two-thirds. Exhibit 6-1 below presents our recommended CBC seismic design parameters.

Exhibit 6-1: 2019 CBC Seismic Design Values

Return Period (years)	Parameters/ Coefficients	Peak Ground Acceleration (PGA) (0-second)	Short Period (0.2-second)	Long Period (1-second)
2,475	Mapped MCE SRA[1] Parameters	PGA = 0.87 g	S_S = 2.04 g	S_1 = 0.73 g
	Site Class Coefficients[2]	F_{PGA} = 1.1	F_a = 1.0	F_v = 1.7
	Adjusted MCE SRA Parameters	PGA_M = 0.96 g	S_{MS} = 2.04 g	S_{M1} = 1.24 g
	Design SRA Parameters	S_{DPGA} = 0.54 g	S_{DS} = 1.36 g	S_{D1} = 0.83 g

NOTES:

1 SRA = Spectral Response Acceleration

2 Site class coefficients correspond to a Site Class D.

g = gravity

6.3.2 Landslides, Mudflow, and Slope Stability

Hazards associated with slope stability include landslides and mudflows. The site and surrounding area are relatively level. Therefore, the potential for the site or the area surrounding the site to experience slope stability hazards is negligible.

No potential impacts associated with landslides, mudflow, or slope stability are anticipated for the project. As such, no additional measures associated with these potential issues are required.

6.3.3 Soil Erosion

Erosion is the process in which soil or earth material is worn away and removed from its original location by natural forces such as moving water or wind. Erosion or the loss of topsoil can potentially lead to instable soil conditions, especially for hillside development or development containing or adjacent to slopes.

Based on the site conditions, site topography, and the proposed improvements, the Project is not anticipated to result in significant impacts associated with erosion, sedimentation, or loss of topsoil. However, grading, excavation, and other earth-moving activities would result in disrupting the ground surface and could potentially result in erosion and loss of topsoil during construction, a potentially significant impact. Furthermore, as with most development, there is a potential adverse impact from uncontrolled drainage.

Potential impacts associated with soil erosion or loss of topsoil are anticipated during construction of the proposed development, as earthwork activities would disrupt the ground surface. No requirements beyond the implementation of existing regulations are required to address these potential impacts. Grading and earthwork shall be performed in

accordance with the 2020 CLABC, specifically section 1804 and Appendix J of the CLABC. For grading performed in the "rainy season", as defined as the months of October to April by the CLABC, provisions will need to be made to control erosions. A Stormwater Pollution Prevention Plan should be prepared prior to the start of construction in accordance with County regulations and should be implemented during construction.

6.3.4 Geologic Instability, Including Lateral Spreading, Liquefaction, and Subsidence

6.3.4.1 Lateral Spreading or Liquefaction

Geologic instability resulting from liquefaction and lateral spreading is discussed above.

6.3.4.2 Subsidence

Subsidence of the ground surface can be caused by the removal of groundwater and/or petroleum from subsurface sources. If groundwater levels or head in petroleum reservoirs are lowered sufficiently, permanent collapse of pore space would result in ground settlement and could potentially damage structural improvements.

The Project site is located in the southern part of the Salt Lake Oil Field. However, we did not find documentation indicating subsidence has occurred due to removal of petroleum. Similarly, we did not find evidence of subsidence from groundwater pumping. Therefore, we conclude that potentially damaging subsidence from extraction of groundwater and/or petroleum during construction or operation of the structures is unlikely.

Temporary dewatering will be required during construction for any excavation which extends beneath the existing groundwater level. Groundwater depth will be confirmed based on completion of our subsurface explorations and preparation of our geotechnical design report, however, based on the available data discussed above, we anticipate relatively shallow groundwater at the Project site, on the order of 5 to 10 feet beneath the ground surface. Based on this, we anticipate temporary dewatering will be required for excavations extending more than 10 feet bgs.

We anticipate groundwater extracted during temporary dewatering will be in relatively small volumes to produce localized drawdown around the excavations. We do not anticipate construction dewatering to adversely impact the existing structures or the proposed improvements. Additional details with respect to temporary dewatering system is discussed in the Recommendations section below.

6.3.4.3 Compressible and Collapsible Soils

Compressible soils are soils which undergo consolidation when subject to a new load, such as a structure load or fill placement. Collapsible soils are soils which significantly decrease in volume when they are wetted and experience an increase in moisture content, regardless of whether a new load is placed on them. Compressible or collapsible soils can lead to excessive settlement distress for structural improvements.

Artificial fill that was not engineered and the near-surface alluvial deposits may be weak and compressible and/or collapsible, particularly with the addition of water. The existing artificial fill may not be suitable to support foundations, slabs on grade, paving or new compacted fills. Furthermore, the surficial alluvial deposits may not be suitable for supporting building loads. Utilizing the existing artificial fill or upper alluvial soils for load support can result with potential significant impact for the proposed structures, as it can lead to structural distress due to total or differential settlement. We recommend removing and replacing unsuitable soil with structural fill or supporting structural loads on deep foundations as described below.

6.3.4.4 Recommendations

Temporary Dewatering:
Temporary dewatering will be required for excavations which extend below the existing groundwater level. As discussed above, we anticipate temporary dewatering will be required for excavations greater than 10 feet bgs. We anticipate the deepest excavations will be associated with the proposed Page Museum one-story addition, as excavations will be required for construction of the proposed mat foundation and associated new utility placement.

Dewatering should be performed prior to excavation. The dewatering system should be designed to lower the site groundwater sufficiently to permit a dry environment and to prevent water seepage from the temporary perimeter cut slopes. The groundwater will be pumped from the tar sands and will contain a relatively high percentage of tar. The tar will need to be removed and the groundwater treated prior to disposal. If dewatering will be utilized, we recommend that a test installation be constructed prior to proceeding with the actual design of the system to verify the design's effectiveness.

It is important that the design of a temporary dewatering system should be performed by an experienced, qualified dewatering contractor, and a plan be developed to monitor the progress of the dewatering prior to proceeding with excavation. The design will need to balance the soil conditions with well spacing and well depth. The tar sands are relatively permeable, however the void spaces are filled with a mixture of tar and water. The water

drains relatively quickly, but the presence of tar reduces the overall permeability of the sands. As such, the presence of tar results with a relatively low permeability of the tar sands and can result with high pore pressures in these deposits. Due to its relatively high viscosity, the tar drains relatively slowly in comparison to the water.

It is our opinion that the most effective method of dewatering will consist of relatively closely spaced wells around the excavation perimeter, referred to as well points. The wells should be properly designed to include perforated casing with annular space filled with suitable filter material. Even with proper design, we anticipate eventual plugging of the wells with tar will occur. The well points should extend past the depth of proposed excavation.

Based on information provided within the "Civil Engineering" sheets prepared by KPFF, we understand a current dewatering system is set up to periodically lower the water level within Lake Pit. The dewatering system consists of collection piping, sump pumps, a sand-oil separator device, and a micro-filter device. In a similar fashion, separator and filter devices should be considered for temporary dewatering pumps to help maintain the system's efficiency and increase the amount of time prior to the pumps being plugged up with tar.

Compressible/Collapsible Soils:
Using the existing artificial fill or upper alluvial soils for support without implementing proper design measures may lead to a significant impact to the proposed development.

Based on the provided Master Plan and Concept Design sheets, we understand the proposed one-story expansion and the proposed entry pavilions and canopies will be supported on shallow foundations. If the proposed shallow foundations are embedded within the existing artificial fill or compressible upper alluvial soils, the development may experience excessive load-induced total or differential settlement, causing structural distress. To address this potential impact, we recommend excavation and replacement of existing compressible materials within the areas of the proposed improvements.

Excavation and replacement consists of complete removal of artificial fill and/or compressible surficial alluvial soil beneath the areas of the proposed improvements and replacement with compacted structural fill. Based on the past available explorations, we anticipate existing artificial fill depth will range between 1 to 8 feet bgs. This value will be confirmed after completion of our subsurface explorations.

Due to the anticipated soil contamination, onsite soils are not anticipated to be suitable for reuse as fill material and will need to be exported for proper remediation and disposal. Thus, structural fill material will need to be imported onsite. For preliminary earthwork

quantity estimates, the "Civil Engineering" sheets prepared by KPFF provide estimated cut and fill quantities. The estimated quantities consist of 7,500 cubic yards of cut material to be exported offsite, and approximately 36,000 cubic yards of fill material to be imported to the site.

The proposed bridge crossing Oil Creek is proposed to be supported on deep foundations. Deep foundations transfer the structure loads to deeper geologic units which are not significantly compressible, thus do not rely on the upper compressible/collapsible soils for support and are not susceptible to the potential load-induced settlement concern. Deep foundations should extend through the fill and upper alluvial soils (Lakewood Formation) and be embedded into the underlying stiff/dense alluvial deposits (San Pedro Formation).

6.3.5 Expansive Soil

Expansive soil occurs when clay particles of certain mineralogy interact with water, causing a volume change. Clay soil may swell with increasing moisture content and contract when dried. This phenomenon generally decreases in magnitude with increasing confining pressure at depth. These volume changes may damage spread footings, grade beams, floor slabs, pavement, and other shallow improvements.

Based on our review of the available data, the upper clay soils within the existing artificial fill and alluvium are subject to expansion and shrinkage resulting from changes in the moisture content. The available data with regard to potential expansive potential is discussed below.

Law/Crandall (1995) noted the onsite clayey soils are expansive. They recommended the expansive soil should not be used beneath building floor slabs or adjacent sidewalks and should not be placed behind retaining walls. Law/Crandall performed an expansion index test for soils collected from Boring B-4 at a depth range of 0 to 5 feet. The test resulted with an Expansion Index (EI) of 98, indicating a high expansion potential (Law/Crandall, 1995).

AECOM (2019) noted that expansion tests performed on collected samples indicated the clayey artificial fill and alluvium has a medium to high expansion potential, which would impact lightly loaded foundation elements and concrete flatwork. AECOM performed two expansion index tests, resulting with EI values of 21 and 64 (for Borings B-15-3 and B-15-4, respectively). An EI value of 21 indicates a low expansion potential, and an EI value of 64 indicates a medium expansion potential (AECOM, 2019).

VB&B (2005b) performed two expansion tests within alluvial clays. The tests resulted with EI values between 65 to 70, indicating a medium soil expansion potential (VB&B, 2005b).

VB&B also reviewed sidewalk heaving issues located north of the Project site (VB&B, 2005a). Prior to construction of the sidewalk, the underlying soils were excavated as deep as 5 feet bgs and recompacted. An expansion test performed on the sidewalk subgrade soil resulted with an EI value of 112, indicating a high expansion potential.

Based on the available data, we anticipate moderately to highly expansive soil to be present onsite, posing a potential significant impact to lightly loaded foundation elements and flatwork (e.g., sidewalks, driveways). Additional expansion testing should be performed for the proposed improvements, particularly in areas of proposed flatwork and lightly loaded canopy foundations. Options to address the potential adverse impact from expansive soils include over-excavation and replacement of the expansive material with a soil having low or non-expansive potential, soil treatment, or through structural design of the proposed improvements.

The recommended option is to overexcavate within the areas of the proposed improvements and replace the expansive material with a soil having a low or non-expansive potential. We recommend that the upper 2 feet of expansive soil (where encountered at the site) be removed and replaced with non-expansive fill.

Another option to address expansive soil potential is to improve the soil through chemical treatment, such as lime treatment. This generally involves mixing a certain percentage of the chemical into the subgrade soil, compacting the mixed soil-chemical material, and then allowing the material curing time prior to continuing construction. The percentage of the chemical addition and the associated engineering properties of the improved soil will need to be determined through geotechnical laboratory testing. If chosen, the geotechnical design report should provide design and construction recommendations related for this option.

A third option is through structural design of the proposed improvements. As discussed above, the expansion potential of soils generally decreases in magnitude with increasing confining pressure at depth. Therefore, structural design option would involve increasing the bearing pressure on the soil and/or extending the foundation or flatwork depth. However, while increasing the bearing pressure reduces the potential impact from expansive soil, it does increase the potential impact associated with excessive settlement. Settlement evaluation should be performed based on the proposed loading conditions and limited to a maximum differential of 1 inch over a 20-foot span within the structure.

6.3.6 Tsunami and Seiche Potential

A tsunami is generated in the ocean from large displacements of the sea floor, which could occur from an earthquake, volcanic explosion, or major submarine landslide. The Project site is located about eight and a half miles from the Pacific Ocean shoreline. In addition,

based on the "Tsunami Hazard Areas" figure for the County, Figure 12.3 of the County's General Plan, the Project site does not lie within a tsunami hazard area. Given the distance from the shoreline, tsunamis are not considered a significant hazard to the Project site and the potential impact from a tsunami is considered negligible.

A seiche occurs when an earthquake or landslide disturbs or displaces water in an enclosed body of water, resulting in waves that extend beyond the normal shoreline. Large bodies of uncovered water such as reservoirs, lakes, or ponds are not located directly up gradient or in the vicinity of the Project site. The nearest applicable body of water is the Hollywood Reservoir, located approximately 4 miles toward the north-northeast. Given the distance, seiches are not considered a significant hazard to the Project site and the potential impact from a seiche is considered negligible.

The existing grades around Lake Pit are between 5 to 9 feet higher than the water surface elevation. Given the elevation differences, the potential for a seiche from Lake Pit to impact the Project is unlikely.

6.3.7 Tar-Impacted Soil and Groundwater Disposal

As discussed above, tar-impacted soil is anticipated for soil beneath the groundwater. Tar-impacted soils and groundwater should be anticipated for excavations deeper than about 10 feet bgs. Based on our experience in the site vicinity, tar content of impacted soil is typically between 10% and 20%. Higher tar content and/or shallower depth of tar-impacted soil could be encountered near tar seeps observed in the Project vicinity.

Spoils from drilling of deep foundations and other excavations that extend below the groundwater will likely contain natural oil or tar. Excavation spoils will require chemical analyses for offsite disposal characterization. If the spoils are characterized as non-hazardous, export to a normal disposal facility is likely. If the spoils are characterized as hazardous, they will require disposal at a designated hazardous waste facility, which is comparatively more expensive than a normal disposal facility. We anticipate groundwater pumped from excavations will require treatment before disposal.

6.3.8 Oil Wells

The likelihood of encountering any known or previously undiscovered oil production well at the site is low. However, if an oil production well is encountered during construction activities, construction work should halt in the immediate area. Both CalGEM and the City Fire Department should be notified immediately. The oil production well(s) should be abandoned in accordance with the requirements of CalGEM and the Los Angeles Fire Department.

6.4 Regulatory Requirements

6.4.1 Development of a Geotechnical Investigation and Geologic Hazard Report

Per Section 1803 of the CLABC, the Project-specific geotechnical investigation and geologic hazard report (i.e., geotechnical design report) will address final design of the Project, incorporating recommendations to mitigate the hazards identified herein. The report shall meet 2020 CLABC requirements and the most current guidelines developed by the County of Los Angeles Department of Public Works Geotechnical and Materials Engineering Division (GMED). Specifically, the report shall:

- Confirm seismic ground-motion parameters,
- Further develop the soil profile at the site,
- Confirm groundwater conditions at the site are as anticipated,
- Evaluate soil strength and adequacy of load-bearing soils,
- Evaluate total and differential settlement potential,
- Recommend structural fill material properties and testing,
- Provide recommendations and design criteria for deep foundation systems, and
- Provide special design and construction criteria for shallow foundations and flatwork founded on expansive soils.

The report shall be prepared by a California-registered geotechnical engineer and California-certified engineering geologist. The geotechnical design and construction recommendations outlined in the geotechnical design report should be incorporated into the Project plans and specifications. Construction of the proposed Project shall be in accordance with the approved plans.

6.4.2 Seismic Loading Conditions

Required earthquake loading considerations are outlined in Section 1613 of the 2020 CLABC. Per Section 1613, every structure or portion of a structure shall be designed to resist the effects of earthquake motions in accordance with the CLABC and ASCE 7, as applicable.

6.4.3 Earthwork Activities

Earthwork activities, such as excavation, grading, and fill placement, shall follow the 2020 CLABC standards outlined in Section 1804 and Appendix J. The final geotechnical design report should provide general design and construction recommendation for earthwork activities.

6.4.4 Drainage

Drainage is a significant factor in the long-term performance of any structure or slope. We recommend drainage devices be incorporated into the civil design to improve performances and limit the potential for foundation instability or excessive erosion. We recommend sloping grades and pavement surfaces to promote gravity flow to drainage swales and catch basins. As discussed above, site grading shall follow the requirements outlined in Section 1804 and Appendix J of the 2020 CLABC, which includes guidelines for site grading to promote positive drainage flow.

6.4.5 Compliance to Applicable Building Codes and Regulations

Project design and construction shall comply with the 2020 CLABC, the most current guidelines outlined by GMED, general County laws, applicable standards published by the State of California, and the recommendations set forth in the geotechnical design report.

7 LIMITATIONS

The recommendations provided in this report are based upon our understanding of the described Project information and our interpretation of the data collected from past subsurface explorations performed by us and others. We have made our recommendations based upon experience with similar subsurface conditions under similar loading conditions. The recommendations apply to the specific Project discussed in this report; therefore, any change in the structure configuration, loads, location, or the site grades should be provided to us so that we can review or conclusions and recommendations and make any necessary modifications.

S&W has prepared and included the document, “Important Information About Your Geology and Soils Discipline Report” to assist you and others in understanding the use and limitations of our report.

8 REFERENCES

8.1 Report Bibliography

Numerous geotechnical studies have been performed within or adjacent to the Project site. Those prior studies have formed the basis for the findings, conclusions and recommendations contained in this report. An alphabetical listing of the prior reports, by the firm responsible for preparation of those reports, is listed below.

AECOM, 2019, Final report, geotechnical investigation, LACMA Building for Permanent Collection (BPC), Los Angeles County Museum of Art, 5905 Wilshire Boulevard, Los Angeles, California: Report prepared by AECOM, Los Angeles, Calif., project no. 60440464, for Los Angeles County Museum of Art, Facility Planning Department, December 19, 654 p.

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URS, 2002, Preliminary report, geotechnical evaluations – mobilization phase, proposed museum replacement project, 5905 Wilshire Boulevard, Los Angeles, California: Report prepared by URS, Los Angeles, Calif., project no. 29401607.00001, for the Los Angeles County Museum of Art, Los Angeles, Calif., September 5.

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Van Beveren & Butelo, Inc. (VB&B), 2008b, Report of geotechnical investigation, proposed phase 2 project, 6067 W. Wilshire Boulevard, Los Angeles, California: Report prepared by Van Beveren & Butelo, Inc., Glendale, Calif., project no. 04-053.7, for the Los Angeles County Museum of Art, Los Angeles, Calif., March 31, 20 p.

8.2 Technical Publications

The following technical publications were reviewed as part of the preparation of the Geology and Soils Discipline Report.

Bilodeau, W.L.; Bilodeau, S.W.; Gath, E.M.; and others, 2007, Geology of Los Angeles, California, United States of America: Environmental and Engineering Geoscience, v. 13, no. 2, p. 99-160.

California Department of Water Resources (DWR), 1961, Planned utilization of the ground water basins of the coastal plain of Los Angeles Count, appendix A, groundwater geology: Sacramento, Calif., California Department of Water Resources Bulletin No. 104.

California Department of Water Resources (DWR), 2004, Coastal plain of Los Angeles groundwater basin, central subbasin: California's Groundwater Bulletin 118, 5 p., available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/4_011_04_CentralSubbasin.pdf

California Division of Mines and Geology (CDMG), 1998, Seismic hazard zone report for the Hollywood 7.5-minute quadrangle, Los Angeles County, California (rev. ed.): California Department of Conservation, Division of Mines and Geology, Seismic Hazard Zone Report 026, 61 p.

California Geologic Energy Management Division (CalGEM), 2022, Well finder, CalGEM GIS: Available: https://maps.conservation.ca.gov/doggr/wellfinder/#openModal/-118.94276/37.12009/6

California Geological Survey (CGS), 2002, Guidelines for evaluating the hazard of surface fault rupture: California Geological Survey Note 49, 4 p., available: https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-49.pdf

California Geological Survey (CGS), 2004, Recommended criteria for delineating seismic hazard zones in California (rev. ed.): California Geological Survey Special Publication no. 118, 18 p., available: https://www.conservation.ca.gov/cgs/Documents/Publications/Special-Publications/SP_118-2004-Criteria-Seismic-Hazard-Zones-CA.pdf

California Geological Survey (CGS), 2008, Guidelines for evaluating and mitigating seismic hazards in California (rev. ed.): California Geological Survey Special Publication no. 117A, 98 p., available: https://www.conservation.ca.gov/cgs/Documents/Publications/Special-Publications/SP_117a.pdf

California Geological Survey (CGS), 2014, Earthquake zones of required investigation, Hollywood quadrangle: California Geological Survey, Earthquake Fault Zones and Seismic Hazard Zones, Hollywood 7.5 Minute Quadrangle, 1 p., 1 sheet, scale 1:24,000. (Revised Official Map).

California Geological Survey (CGS), 2018a, Earthquake fault zones, a guide for government agencies, property owners/developers, and geoscience practitioners for assessing fault rupture hazards in California (rev. ed.): California Geological Survey Special Publication no. 42, 93 p., available: https://www.conservation.ca.gov/cgs/Documents/Publications/Special-Publications/SP_042.pdf

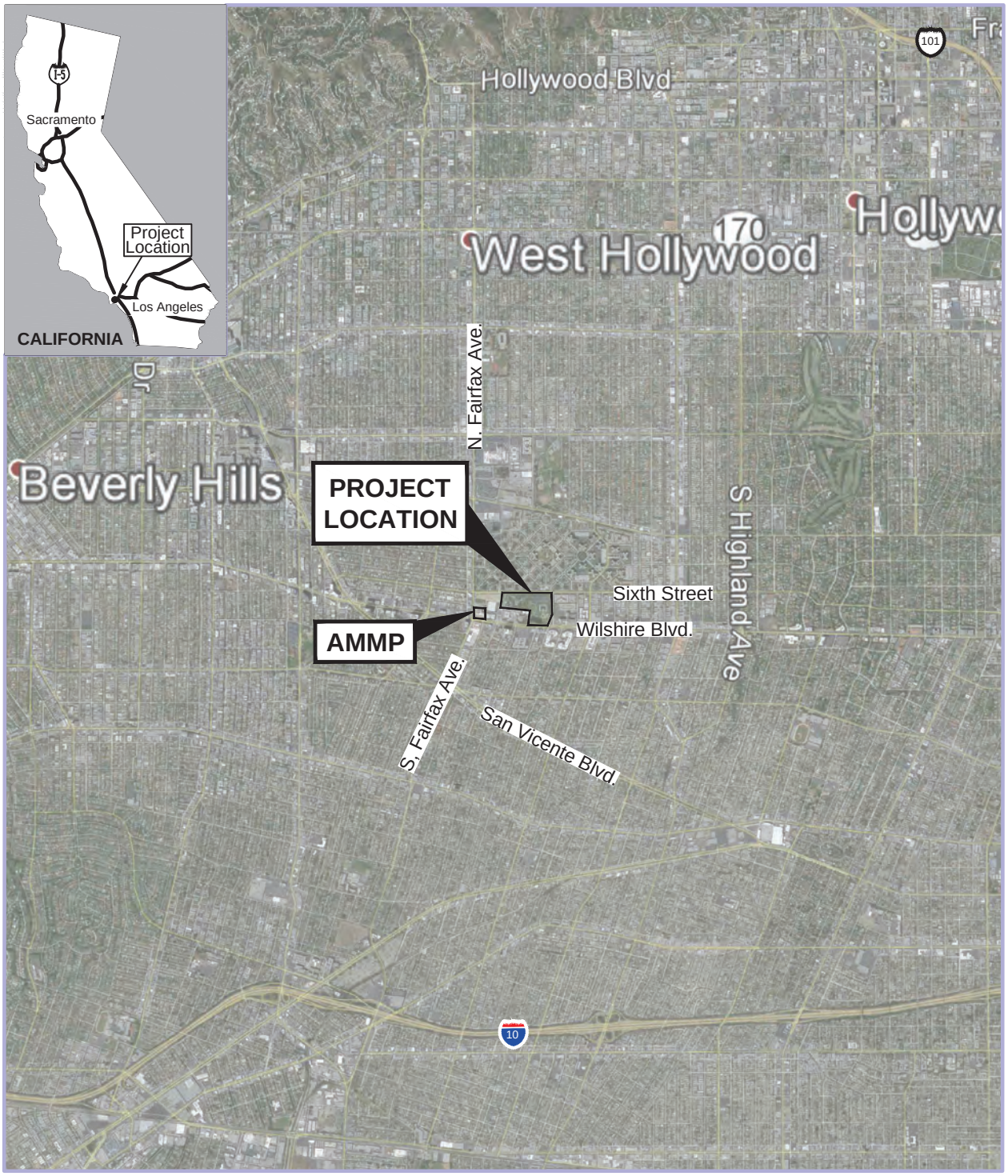
California Geological Survey (CGS), 2018b, Earthquake zones of required investigation, Beverly Hills quadrangle: California Geological Survey, Earthquake Fault Zones and Seismic Hazard Zones, Beverly Hills 7.5 Minute Quadrangle, 1 p., 1 sheet, scale 1:24,000. (Revised Official Map).

Deane, R.T.; Pradel, Daniel; and Robertson, C.A., 2018, Characterizing the strength of tar sands in Los Angeles, a case history, in Lemnitzer, Anne; Steudlein, A. W.; and Suleiman, M. T., eds., Recent developments in geotechnical engineering practice, IFCEE 2018, Orlando, Fla., Proceedings: Reston, Va., American Society of Civil Engineers, Geotechnical Practice Publication no. 11, p. 458-469.

Dibblee, T.W. and Ehrenspeck, H.E., 1991, Geologic map of the Hollywood and Burbank (south 1/2) quadrangles, Los Angeles County, California: Santa Barbara, Calif., Dibblee Geological Foundation, map no. DF-30, scale 1:24,000.

Petersen, M.D.; Bryant, W.A.; Cramer, C.H.; and others, 1996, Probabilistic seismic hazard assessment for the State of California: California Department of Conservation, Division of Mines and Geology Open-File Report 96-08 (also U.S. Geological Open-File Report 96-706), available: https://pubs.er.usgs.gov/publication/ofr96706

Weldon, R.J., II; Fumal, T.E.; Powers, T.; and others, 2002, Structure and earthquake offsets on the San Andreas fault at the Wrightwood, California Paleoseismic Site: Bulletin of the Seismological Society of America, Special Issue on Paleoseismology of the San Andreas Fault System, v. 92, no. 7, p. 2704-2725.



0 2000 4000 8000

SCALE: 1"=4000'

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

VICINITY MAP

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FIG. 1

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Vicinity Map.dwg Layout: Figure 1 Date: 09-20-2022 Login: JRS

LEGEND

	Approximate Limit of Work
AECOM-B-15-4	Boring Designation and Approximate Location *(AECOM, 2019)*
AMC-2014-M-109	Boring Designation and Approximate Location *(Metro GDR, 2014)*
VBB-2005-B-5	Boring Designation and Approximate Location *(Van Beveren & Butelo, 2005)*
URS-2003-B-4	Boring Designation and Approximate Location *(URS, 2003)*
URS-2002-B-2	Boring Designation and Approximate Location *(URS, 2002)*
L/C-1998-B-9	Boring Designation and Approximate Location *(Law-Crandall, 1998)*
L/C-1995-B-9	Boring Designation and Approximate Location *(Law-Crandall, 1995)*
LCA-1984-B-4	Boring Designation and Approximate Location *(LeRoy Crandall, 1984)*
LCA-1982-B-3	Boring Designation and Approximate Location *(LeRoy Crandall, 1982)*

0 120 240

Scale in Feet

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

SITE PLAN

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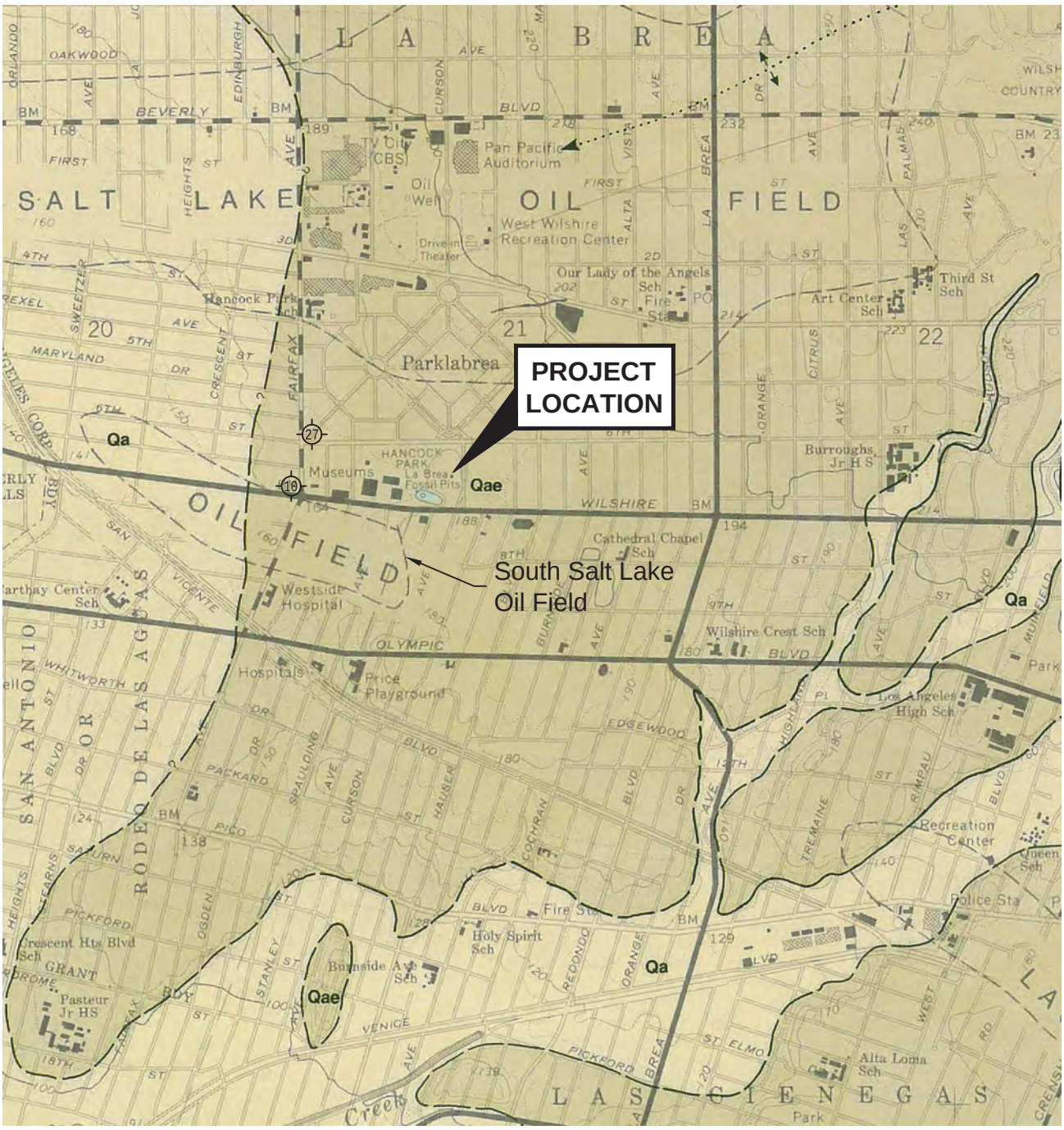
FIG. 2

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Site Plan.dwg Layout: Figure 2 Date: 09-20-2022 Login: JRS



LEGEND

Geologic Units

Qa Alluvium

Qae Alluvium (Elevated)

Oil Wells

10 Chevron 10

27 Chevron Salt Lake 27

NOTE

Map adapted from drawing titled Geologic Map of the Hollywood and Burbank Quadrangle, by Thomas W. Dibblee, jr., 1991.

0 1000 2000 4000

SCALE: 1"=2000'

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

REGIONAL GEOLOGY MAP

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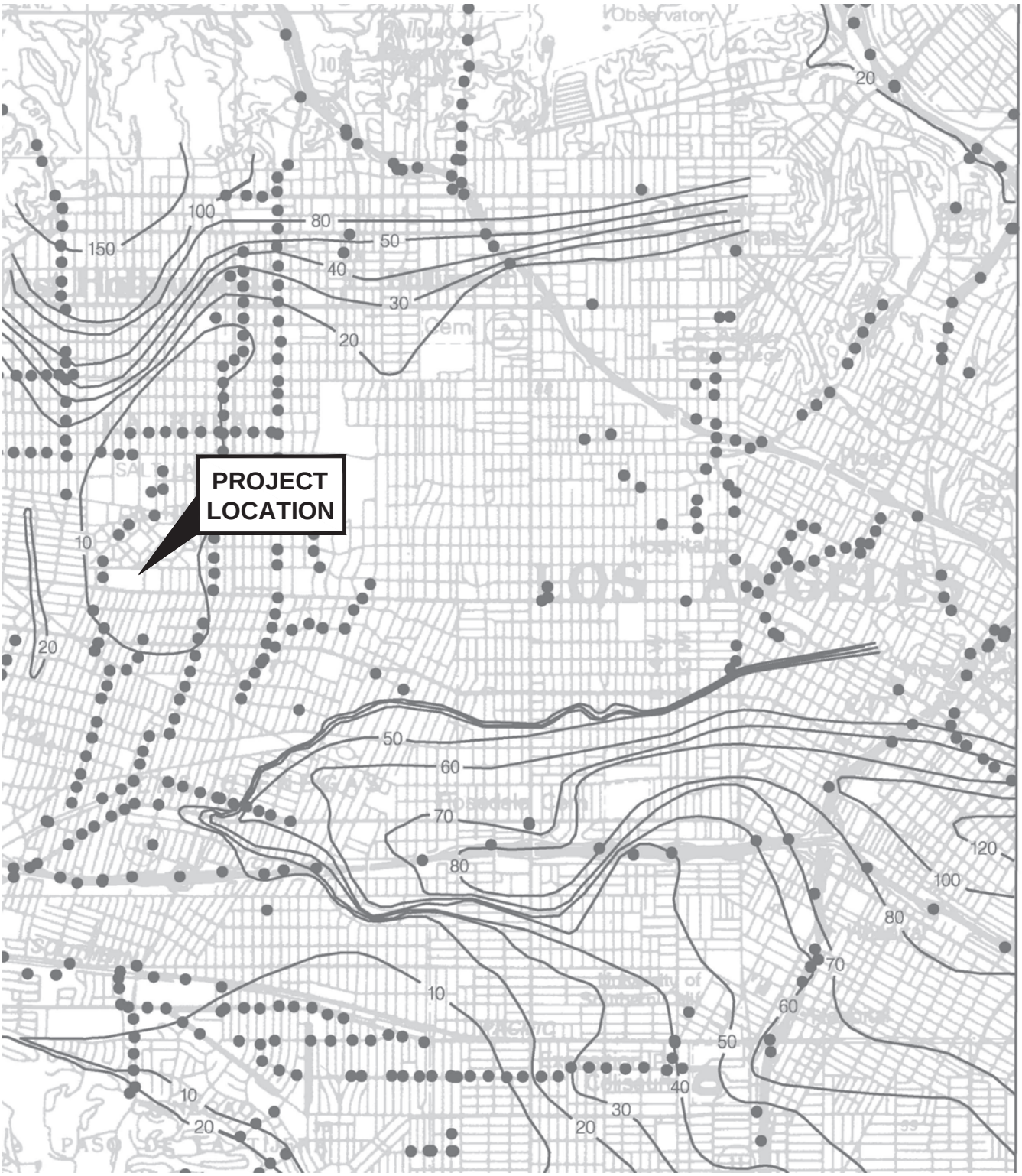
FIG. 3

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Geology Map.dwg Layout: Figure 3 Date: 08-25-2022 Login: JRS



0 0.5 1 2

SCALE: 1 inch = 1 mile

NOTES

1. Numbers are depth below ground surface.
2. Map adapted from Seismic Hazard Zone Report For the Hollywood 7.5-Minute Quadrangle, Los Angeles County, California, Plate 1.2, 1998.

N

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

HISTORICAL HIGH GROUNDWATER MAP

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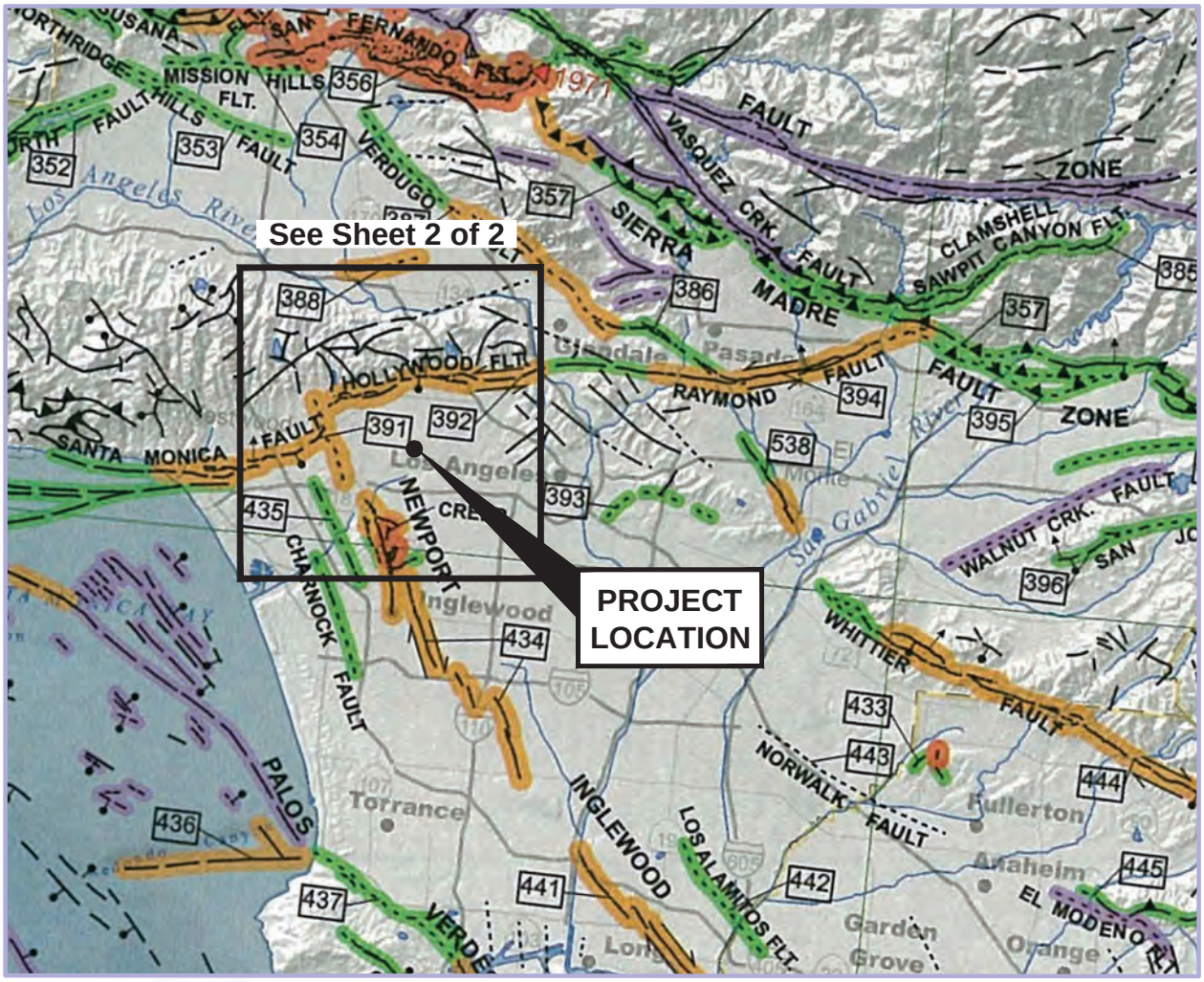
FIG. 4

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Hist High GW.dwg Layout: Figure 4 Date: 08-25-2022 Login: JRS



EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred.

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate).

0 20,000 40,000 80,000

SCALE: 1"=40,000'

NOTE

Map adapted from Fault Activity Map of California, 2010 by California Geological Survey.

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

REGIONAL FAULT MAP

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FIG. 5
Sheet 1 of 2

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Fault Map.dwg Layout: Figure 5-1 Date: 08-25-2022 Login: JRS

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred.

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate).

0 5,000 10,000 20,000

SCALE: 1"=10,000'

NOTE

Map adapted from Fault Activity Map of California, 2010 by California Geological Survey.

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

REGIONAL FAULT MAP

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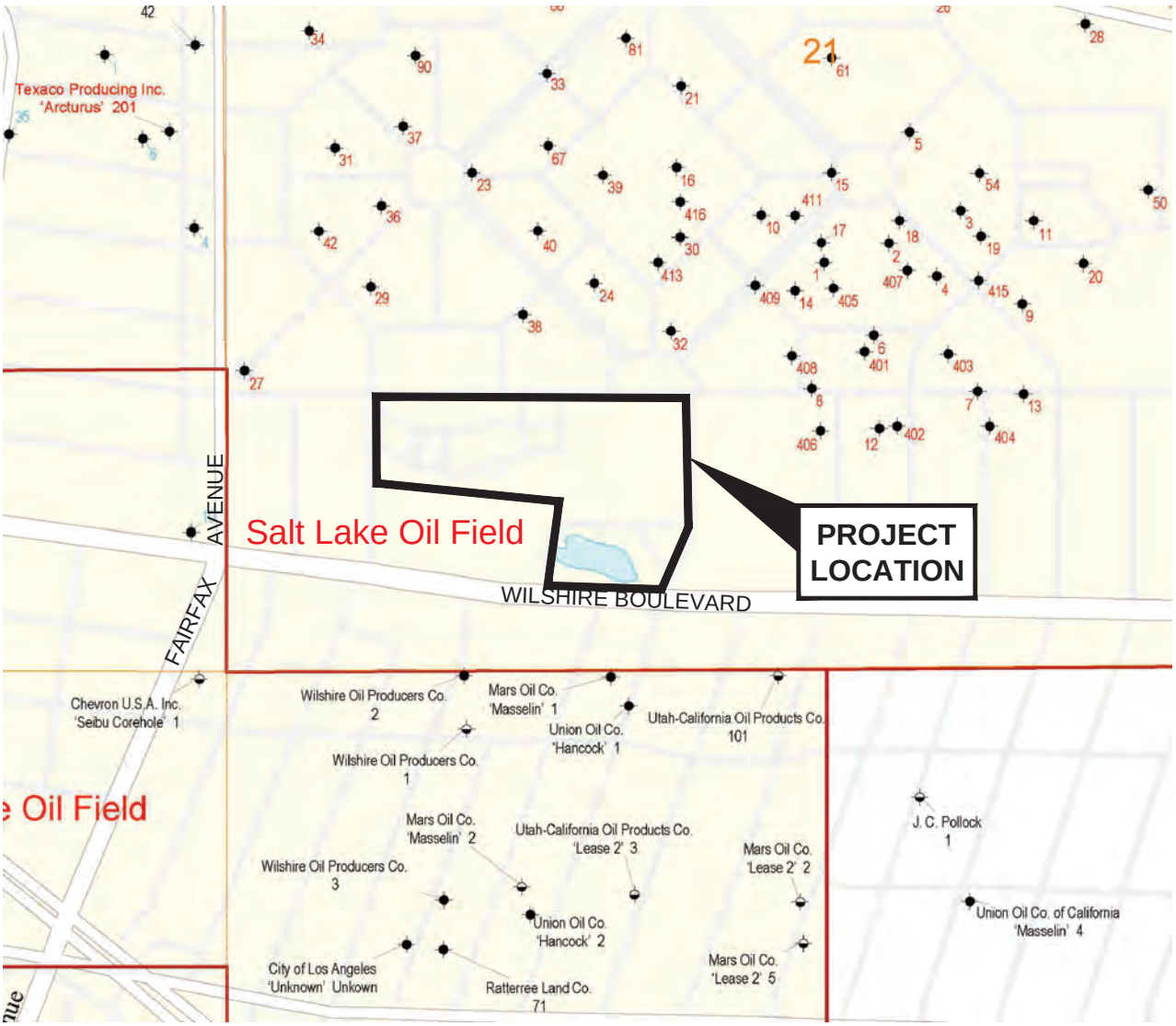
FIG. 5
Sheet 2 of 2

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Fault Map.dwg Layout: Figure 5-2 Date: 08-25-2022 Login: JRS



0 1000 2000

Scale in Feet

LEGEND

- Plugged and abandoned - oil
- Drilling - idle
- Plugged and abandoned - dry hole

NOTE

Map adapted from Oil Field Map, District 1, Map 118, by Division of Oil, Gas, and Geothermal Resources, dated September 17, 2003.

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

OIL WELL AND FIELD MAP

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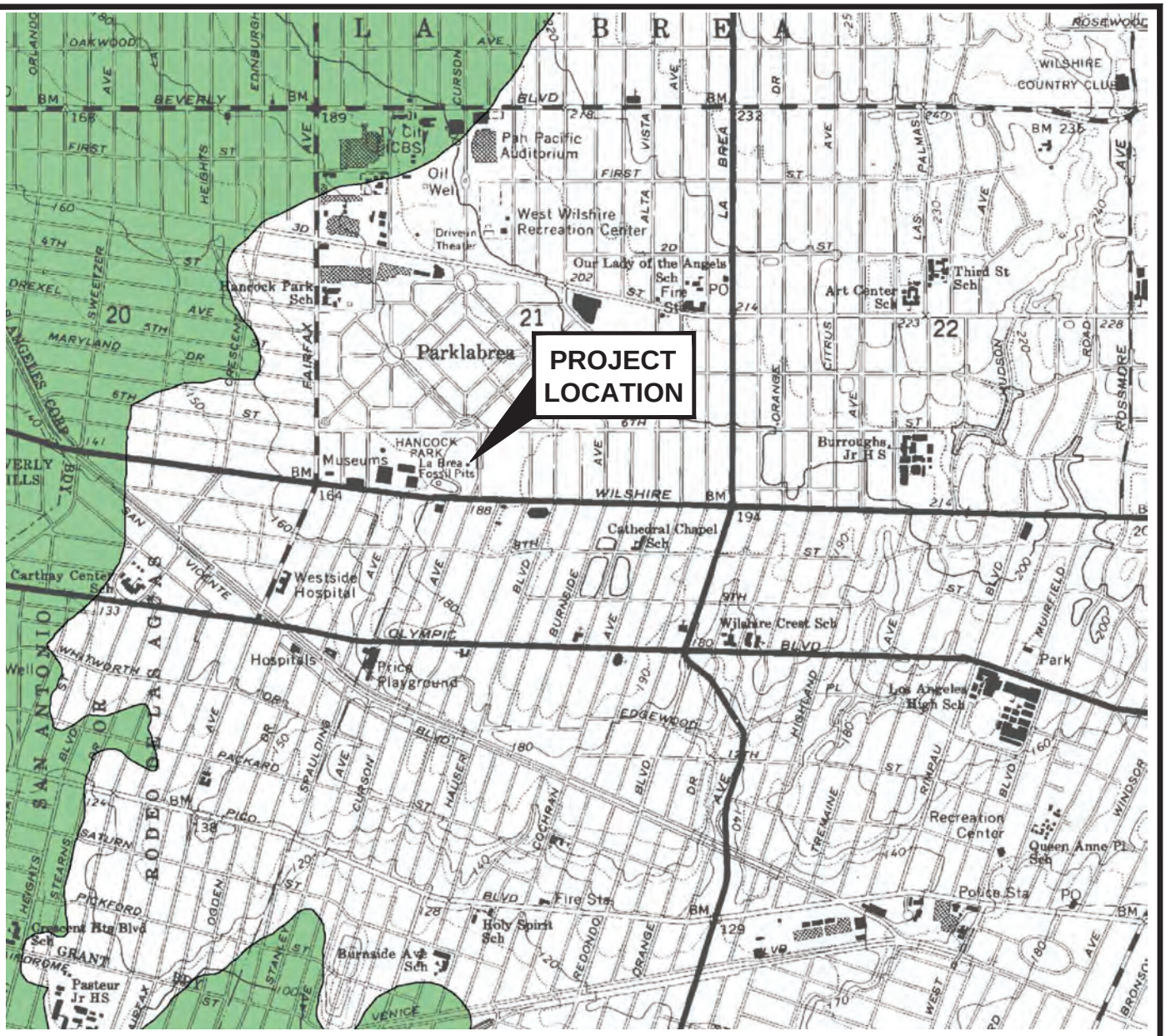
FIG. 6

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Oil Well and Field.dwg Layout: Figure 7 Date: 09-20-2022 Login: JRS



MAP EXPLANATION

Zones of Required Investigation:

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

N

0 1000 2000 4000

SCALE: 1"=2000'

NOTE

Map adapted from drawing titled State of California Seismic Hazards Zones, Hollywood Quadrangle, By Division of Mines and Geology, Dated March 25, 1999.

La Brea Tar Pits Museum Master Plan
Hancock Park
Los Angeles, California

SEISMIC HAZARD ZONES MAP

January 2023 | 109748-001

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FIG. 7

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_LAX\109748\001\109748-001 Seismic Hazards.dwg Layout: Figure 6 Date: 08-25-2022 Login: JRS

APPENDIX A: PAST S&W AND VB&B FIELD EXPLORATIONS

Appendix A

Past S&W and VB&B Field Explorations

CONTENTS

- Van Beveren & Butelo, Inc., 2005b, BCAM and Subterranean Garage
  - Boring 4
  - Boring 5

BORING 4

Date Drilled: October 4, 2004
Equipment Used: Rotary Wash (5-inch-dia.)

Depth to Water: 6.6 feet
Driving Weight & Drop: 400 lbs. / 18 inches (Sample)
140 lbs. / 30 inches (SPT)

SURFACE ELEVATION: 171.0 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE* (% of dry wt.)	DRY DENSITY** (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION	Description
							Landscape Layer
							FILL SC - SANDY CLAY - brown
170		18.2	107	12			
	5	19.5	105	14			bluish gray to brown
165							some gravel (up to 1")
							NATURAL CH - CLAY - some sand, bluish gray
	10	38.3	82	8			[LL=57, PI=45]
160							
	15	24.8	99	17			some asphalt stains
155							
							SM - SILTY SAND - fine to medium, some asphalt stains, brown
	20	19.0	105	17			SP - ASPHALT SAND - fine, black
150		16.0	104	19			
	25	14.0	102	27			
145		6.9	111	28			
	30			31			[No Sample Recovery]
140		7.8	110	35			
		5.9	114	35			
	35						
135			55 for 6"				few gravel (up to 3/4")
	40						

(Continued on next page)

* MOISTURE = VOLATILE LIQUIDS

** DRY DENSITIES INCLUDE THE WEIGHT OF SOIL AND NON-VOLATILE ASPHALT

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-053 By: FA Date: 10-18-2004 Checked: VB Printed: 10-25-04 [LOG FOR FIELD; 04-053.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.4a

BORING 4
(Continued)

Date Drilled: October 4, 2004
Equipment Used: Rotary Wash (5-inch-dia.)

Depth to Water: 6.6 feet
Driving Weight & Drop: 400 lbs. / 18 inches (Sample)
140 lbs. / 30 inches (SPT)

SURFACE ELEVATION: 171.0 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE* (% of dry wt.)	DRY DENSITY* (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION	
							SP - ASPHALT SAND - (Continued)
130							
		5.2	103		58		few gravel (up to 1")
	45						
125							
			53 for 6"				
	50						
120							
		4.8	114		53		few shells
	55						
115							
			57 for 6"				
	60						
110							
		4.7	100		50		
	65						
105							
			35 for 6" 50 for 4"				
	70						
100							
	75	6.8	103		50		**END OF BORING AT 75 FEET.**
95							
	80						

Notes:

1) Fill to 8 feet.

2) Groundwater measured at a depth of 6.6 feet, 15 days after completion of drilling.

3) Installed two-inch-diameter PVC casing to permit future groundwater monitoring. Casing bottom covered with cap and sealed. Drilling mud removed before well construction.

4) Boring covered with traffic cover. Soil cuttings and drilling mud placed in disposal barrels.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-053 By: FA Date: 10-18-2004 Checked: VB Printed: 10-25-04 [LOG FOR FIELD; 04-053.GPJ]

* **MOISTURE = VOLATILE LIQUIDS**

** **DRY DENSITIES INCLUDE THE WEIGHT OF SOIL AND NON-VOLATILE ASPHALT**

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.4b

BORING 5

Date Drilled: October 5, 2004
Equipment Used: Rotary Wash (5-inch-dia.)

Depth to Water: 5.5 feet
Driving Weight & Drop: 400 lbs. / 18 inches (Sample)
140 lbs. / 30 inches (SPT)

SURFACE ELEVATION: 170.1 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE* (% of dry wt.)	DRY DENSITY** (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION	Description
							Landscape Layer
							FILL SC - SANDY CLAY - brown
							NATURAL SM - SILTY SAND - fine to medium, brown
		18.0	105	12			
165	5						SP/SM - SAND/SILTY SAND - fine to medium, some gravel (up to 2"), brown
		14.4	116	17			[11.5% Passing 200 Sieve]
160	10						CH - CLAY - some sand and peat, some asphalt stains, bluish gray to dark gray
				11			[No Sample Recovery]
155	15						
		38.3	76	12			
150	20						
		25.8	91	12			few gravel (up to 2")
							SP - ASPHALT SAND - fine, black
145	25	6.1	110	50			
		6.6	111	40			few gravel (up to 1½")
		6.9	109	40			
140	30	4.9	108	50			
		6.4	111	50			
135	35	4.8	105	50			
	40		53 for 6"				

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

(Continued on next page)

* MOISTURE = VOLATILE LIQUIDS

** DRY DENSITIES INCLUDE THE WEIGHT OF SOIL AND NON-VOLATILE ASPHALT

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.5a

Job No: 04-053 By: FA Date: 10-19-2004 Checked: VB Printed: 10-25-04 [LOG FOR FIELD; 04-053.GPJ]

BORING 5
(Continued)

Date Drilled: October 5, 2004
Equipment Used: Rotary Wash (5-inch-dia.)

Depth to Water: 5.5 feet
Driving Weight & Drop: 400 lbs. / 18 inches (Sample)
140 lbs. / 30 inches (SPT)

SURFACE ELEVATION: 170.1 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE* (% of dry wt.)	DRY DENSITY** (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION	
							SP - ASPHALT SAND - (Continued)
125	45	3.4	104	50			few thin gravelly layers [Rig Chattering]
120	50			40 for 6" 50 for 6"			
115	55	5.2	107	50			few gravel (up to 1")
110	60			43 for 6" 50 for 3"			
105	65	3.6	111	50			few gravel (up to ½")
100	70			39 for 6" 50 for 3"			
95	75	3.7	118	50			few shells **END OF BORING AT 75 FEET.**
	80						

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Notes:

1) Fill to 2 feet.

2) Groundwater measured at a depth of 5.5 feet, 14 days after completion of drilling.

3) Installed two-inch-diameter PVC casing to permit future groundwater monitoring. Casing bottom covered with cap and sealed. Drilling mud removed before well construction.

4) Boring covered with traffic cover. Soil cuttings and drilling mud placed in disposal barrels.

* MOISTURE = VOLATILE LIQUIDS

** DRY DENSITIES INCLUDE THE WEIGHT OF SOIL AND NON-VOLATILE ASPHALT

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

Job No: 04-053 By: FA Date: 10-18-2004 Checked: VB Printed: 10-25-04 [LOG FOR FIELD; 04-053.GPJ]

FIGURE A-1.5b

APPENDIX B: PREVIOUS EXPLORATIONS BY OTHERS

Appendix B

Previous Explorations by Others

CONTENTS

- AECOM (2019), LACMA BPC
  - Boring B-15-2
  - Boring B-15-3
  - Boring B-15-4
- URS (2003), BCAM
  - Boring B-8
- URS (2002), Museum Replacement Project
  - Boring B-1
  - Boring B-2
- Los Angeles Metro (2014), Geotechnical Data Report, Westside Subway Extension
  - AMEC, Boring G-121
  - AMEC, Boring M-108
  - AMEC, Boring M-109
  - AMEC, Boring E-114A
  - AMEC, Boring E-114B
  - AMEC, Boring S-105
  - AMEC, Boring S-116
  - AMEC, Boring S-117
- Law/Crandall, Inc. (1998), Report for Proposed Additions to Hancock Park
  - Boring B-1
  - Boring B-2
  - Boring B-3
  - Boring B-4
  - Boring B-5
  - Boring B-6
  - Boring B-7
  - Boring B-8
  - Boring B-9

APPENDIX B: PREVIOUS EXPLORATIONS BY OTHERS

- Law/Crandall, Inc. (1995), Report for Proposed Additions to Hancock Park
  - Boring B-1
  - Boring B-2
  - Boring B-3
  - Boring B-4
  - Boring B-5
  - Boring B-6
  - Boring B-7
  - Boring B-8
  - Boring B-9
- LeRoy Crandall and Associates (1982), Proposed Additions at 5905 Wilshire Boulevard
  - Boring B-1
  - Boring B-3
- LeRoy Crandall and Associates (1984), Completion of Exploration Program
  - Boring B-4

Date(s) Drilled	11/20/15	Logged By	ALC
Drilling Method	Hollow Stem Auger	Drill Bit Size/Type	7-1/2" bullet bit
Drill Rig Type	CME 75	Hammer Data	140 lbs, 30-inch drop
Sampling Method(s)	Bulk, SPT, MC		
Approximate Groundwater Depth and Date Measured	No groundwater encountered		
Coordinate System		Location (ft and/or °)	Latitude 34.06332 Longitude -118.35712

Boring B-15-2

Sheet 1 of 3

Job Number	60440464
Total Depth Drilled (ft)	87.5
Approximate Ground Surface Elevation (ft)	171.2

Elevation (ft)	Depth (ft)	Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
	0						AC	**4-inch thick Asphalt**							
170							BASE	**14-inch thick Base**							
							CH	**ALLUVIUM [Qal]** **Sandy Fat CLAY** medium stiff to stiff, greenish gray mottled with dark brown, moist, high plasticity, some fine to coarse SAND, bedded with 5-inch thin layer of Sandy Lean CLAY, dark brown, moist, fine-grained sand							
	5		1	7	2 3 4				28		54	56	36		
	10						SC	**Clayey SAND** dense, dark grayish brown to very dark brown, moist, low to medium plasticity							
160			2	43	16 19 24				20	81	40	46	19		DSCD, CORR, CON
	15						CL	**LAKEWOOD FORMATION [Qlw]** **Sandy Lean CLAY** stiff to very stiff, very dark brown, moist, some fine SAND, low to medium plasticity, with tar veins							
			3	12	2 4 8				19		65				Tar Content (6.1%)
	20						SM	**SAN PEDRO FORMATION [Qsp]** **Silty SAND** very dense, black, slightly moist, fine to medium, with tar, strong hydrocarbon odor							
150			4	100+	24 48 50/2"				13	98					TXCU
	25						SM	**Silty SAND with GRAVEL** very dense, black mottled with olive, slightly moist, little fine subangular GRAVEL, bedded with 2-inch thin layer of bluish gray SILT							
			5	100+	33 41 50/4"				4						Tar Content (11.4%)
	30														

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LOG OF BORING

LACMA Phase III Transformation Project
5905 Wilshire Blvd, Los Angeles, CA
FOR: Los Angeles County Museum of Art

AECOM

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
	30						SP	**Poorly graded SAND with GRAVEL** very dense, black, slightly moist, fine to medium, little coarse sand, little fine gravel, trace of coarse subrounded to rounded gravel, strong hydrocarbon odor							
140			6	100+	49 50/4"										
	35						SP-SM	**Poorly graded SAND with SILT and GRAVEL** very dense, black, slightly moist, fine to medium, little coarse, little fine subrounded gravel, strong hydrocarbon odor							
			7	58	14 24 34				2						Tar Content (17.5%)
	40						SP-SM	**Poorly graded SAND with SILT** very dense, black, moist, fine to medium grained, trace fine subangular gravel, trace shell fragments							
130			8	100+	32 50/5"				3	121					TXCU
	45														
			9	100+	32 50/4"			some coarse grained, few fine angular gravel							
	50														
120			10	100+	32 48 50/5"			fine SAND, trace coarse, trace fine angular gravel							
	55														
			11	36	12 15 21		CL	little shell fragments **Lean CLAY** hard, very dark grayish brown, moist, medium plasticity, few tar veins	21						Tar Content (14.9%)
	60														
110			12	100+	50/5"			dark brown, few fine sand	21	98					
	65														
			13	34	9 12			very dark grayish brown, light hydrocarbon odor							

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

LOG OF BORING

LACMA Phase III Transformation Project

AECOM

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
					22		CL	**Lean CLAY** *(continued)*							
	70														
-100			14	100+	20 50/5"			very dark grayish brown mottled with dark olive brown, some tar veins, strong hydrocarbon odor							
	75														
			15	45	10 19 26			very dark grayish brown, trace tar veins	20						Tar Content (10.6%)
	80														
-90			16	100+	21 50/5"			no tar veins	14	95					
	85														
			17	42	10 17 25			very dark brown, trace tar veins							
								Bottom of boring at 87.5 feet bgs. No groundwater was encountered during drilling. Boring backfilled with cement bentonite grout.							
	90														
-80															
	95														
	100														
-70															
	105														

LOG OF BORING

LACMA Phase III Transformation Project

AECOM

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Date(s) Drilled	11/2/15-11/3/15	Logged By	ALC
Drilling Method	Hollow Stem Auger	Drill Bit Size/Type	7-1/2" bullet bit
Drill Rig Type	CME 75 (Limited Access)	Hammer Data	140 lbs, 30-inch drop
Sampling Method(s)	Bulk, SPT, MC		
Approximate Groundwater Depth and Date Measured	Groundwater encountered approximately at 30' bgs.		
Coordinate System		Location (ft and/or °)	Latitude 34.06282 Longitude -118.35757

Boring B-15-3

Sheet 1 of 3

Job Number	60440464
Total Depth Drilled (ft)	88.5
Approximate Ground Surface Elevation (ft)	168.5

Elevation (ft)	Depth (ft)	Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
	0						CONC	**16-inch thick Concrete**							
							CL	**ARTIFICIAL FILL [af]** **Sandy Lean CLAY** very stiff to hard, black, moist, low to medium plasticity, very fine grained sand							
	5		BLK-1												
			1	53	33 29 24										EI (21)
160															
							CL	**LAKEWOOD FORMATION [Qlw]** **Sandy Lean CLAY** very stiff, very dark brown, medium plasticity, with little tar along fractures							
	10														
			2	19	4 9 10										
	15		BLK-2												
							SM	**SAN PEDRO FORMATION [Qsp]** **Silty SAND** dense, black, moist, fine- to medium grained	3	121					TXCU
150															
	20														
			4	32	11 13 19			fine- to medium-grained sand, increase in tar	2						Tar Content (14.1%)
	25		BLK-3												
							SP-SM	**Poorly graded SAND with SILT** very dense, black, moist, medium-grained sand, trace subrounded gravel	4	118					TXCU
140															
	30														

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LOG OF BORING

LACMA Phase III Transformation Project
5905 Wilshire Blvd, Los Angeles, CA
FOR: Los Angeles County Museum of Art

AECOM

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
	30						SM	**Silty SAND** very dense, balck, moist, with three 1-inch layers of fine subrounded to rounded gravel, trace of well lenses							
			6	45	15 17 28				5						Tar Content (14.6%)
	35		BLK-4												
							SM	**Silty SAND with GRAVEL** very dense, black, moist, fine to medium grained, little fine gravel, with tar, strong hydrocarbon odor							
			7	100+	29 49 50/3"				20	74					TXCU
130															
	40														Tar Content (17.7%)
							SP-SM	**Poorly graded SAND with SILT** very dense, black, moist, trace of shell fragments							
			8	42	15 19 23				4						Tar Content (16.8%)
	45		BLK-5												
							SM	**Silty SAND** black, moist, fine to medium grained, with pockets of clay, trace subrounded coarse gravel							
			9	100+	42 50/3"										
120															
	50														
			10	41	14 18 23			no clay, no gravel							
	55		BLK-6												
			11	100+	26 52/6"			little coarse grained sand	11	98					
110							CL	**Lean CLAY** hard, dark brown, moist, low to medium plasticity							
	60														
			12	35	9 15 20				20						Tar Content (15.9%)
	65		BLK-7												
			13	100+	20										

LOG OF BORING

LACMA Phase III Transformation Project

AECOM

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
					58/6"		CL	**Lean CLAY***(continued)*							
100	70														
			14	44	10 17 27			top 6-inches with spots of tar along fractures							Tar Content (12.7%)
	75		BLK-8												
			15	100+	30 50/4.5"			trace of tar along fractures	18	91					
90	80														
			16	40	10 16 24			tar along fractures	18						Tar Content (10.8%)
	85														
			17	100+	25 52/6"										
80	90							Bottom of boring at 88.5 feet bgs. Borehole was backfilled with cement bentonite grout to 59 feet bgs, and was converted to groundwater monitoring well.							
	95														
70	100														
	105														

LOG OF BORING

LACMA Phase III Transformation Project

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Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

Date(s) Drilled	10/15/15-10/16/15	Logged By	ALC
Drilling Method	Rotary Wash	Drill Bit Size/Type	3-7/8" tricone bit
Drill Rig Type	D20	Hammer Data	140 lbs, 30-inch drop
Sampling Method(s)	Bulk, SPT, MC		
Approximate Groundwater Depth and Date Measured	Not measured		
Coordinate System		Location (ft and/or °)	Latitude 34.06401 Longitude -118.35857

Boring B-15-4

Sheet 1 of 4

Job Number	60440464
Total Depth Drilled (ft)	121.5
Approximate Ground Surface Elevation (ft)	169.8

Elevation (ft)	Depth (ft)	Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
	0		Blk-1				AC	**6-inch thick ASPHALT**							
							BASE	**12-inch thick BASE**							
							CL	**ALLUVIUM [Qal]** **Lean CLAY** stiff, black, moist, medium plasticity, few coarse grained sand, with little calcification and organics							EI (64), R-Value
	5		1	7	1 3 4										
							CL	**LAKEWOOD FORMATION [Qlw]** **Sandy Lean CLAY** stiff, mottled black and olive, moist, very fine-grained sand, with silt, medium plasticity							
160	10		2	13	2 4 9				25	89					PP = 1.5 tsf DSCD Tar Content (3.8%)
							SC	**SAN PEDRO FORMATION [Qsp]** **Clayey SAND** dense, black with very dark grayish green mottles, moist, fine to medium grained, with tar, hydrocarbon odor							
	15		3	25	6 9 16										
150	20		4	50	23 23 27			very dark grayish green, medium- to coarse-grained sand, increase in tar	10	118					TXCU
	25		5	40	4 7 33			very dense							
140	30														

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LOG OF BORING

LACMA Phase III Transformation Project
5905 Wilshire Blvd, Los Angeles, CA
FOR: Los Angeles County Museum of Art

AECOM

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

Elevation (ft)	Depth (ft)	Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
	30		6	100+	23 50/4"		SC	**Clayey SAND***(continued)* black, little tar	13						Tar Content (16.2%)
	35		7	38	17 15 23			dense, medium grained, with tar, little coarse sand, hydrocarbon odor							
130	40		8	100+	37 50/4"			very dense	12	92					
	45		9	100+	39 50/4"			increase in sand							
120	50		10	100+	33 50/2"		SP	**Poorly graded SAND with GRAVEL** very dense, black, moist, medium-grained sand, some fine angular gravel, increase in tar	3						Tar Content (13.8%)
	55		11	100+	28 50/6"		SP-SM	**Poorly graded SAND with SILT** very dense, black, moist, fine to medium grained	9						Tar Content (17.9%)
110	60		12	100+	44 50/3"		SM	**Silty SAND** very dense, black, moist	19	85					
	65		13	70	29 27 43		CL	**Sandy Lean CLAY** hard, very dark grayish green, moist, medium plasticity, fine-grained sand with little coarse-grained sand, trace of fine angular gravel, with mottled white sand pockets							

LOG OF BORING

LACMA Phase III Transformation Project

AECOM

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
							CL								
100	70		14	62	16 23 39			very dark brown	28	80					PP > 4.5 tsf Tar Content (9.9%) DSCD
	75		15	52	8 19 33			with tar along fractures							
90	80		16	100+	16 35 50/4"			decrease in tar	15	85					PP > 4.5 tsf
	85		17	54	10 21 33										
							SP-SM	**Poorly graded SAND with SILT** very dense, black, moist, fine-grained sand, with strong hydrocarbon odor							
80	90		18	100+	23 50/5"										PP > 4.5 tsf
							CL	**FERNANDO FORMATION [Tf]** **Lean CLAY** very dark grayish brown, moist, medium plasticity, with little tar along fractures							
	95		19	43	11 19 24										
70	100		20	100+	38 48 50/5"			No recovery							
	105														

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

LOG OF BORING

LACMA Phase III Transformation Project

AECOM

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Blows per 6 inches	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	% Passing No. 200 Sieve	Liquid Limit (%)	Plasticity Index (%)	PID Reading (ppm)	OTHER TESTS AND REMARKS
	105		21	45	12 17 28		CL	**Lean CLAY***(continued)*							
							CL	**Sandy Lean CLAY** hard, black, moist, very fine-grained sand, heavy tar							
60	110		22	100+	21 50/6"										PP > 4.5 tsf
	115		23	58	12 24 34										
50	120		24	100+	44 50/2"			No recovery							
								Bottom of boring at 121.5 feet bgs. Boring was backfilled with cement bentonite grout to 32 feet bgs, and was reamed to 8-inch diameter between existing ground and 32 feet bgs by hollow stem auger to convert to groundwater monitoring well.							
	125														
40	130														
	135														
30	140														

LOG OF BORING

LACMA Phase III Transformation Project

AECOM

Report: DMG4; Project File: C:\USERS\DENNIS.NGUYEN\DESKTOP\EARLY SITE PREPARATION\BORING LOGS REV3.GPJ; Data Template:URS HSA LOGS 2010.GDT Printed: 7/30/19

Date(s) Drilled	10/15/03	Logged By	Joe Gratzer
Drilling Method	Hollow Stem Auger	Drill Bit Size/Type	8-inch O.D.
Drill Rig Type	B61	Hammer Data	140 lbs, 30-inch drop
Sampling Method(s)	SPT, Dames & Moore Type-U, Bulk		
Approximate Groundwater Depth and Date Measured	Perched groundwater at 18 feet below the existing ground surface		
Comments			

Boring B-8

Sheet 1 of 2

Job Number	29401607.00002
Total Depth Drilled (ft)	41.0
Approximate Ground Surface Elevation (ft)	165 feet MSL

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0		BK-1			CL	**FILL** Sandy CLAY dark brown, moist, fine Grades light brown			
160	5					SC	**ALLUVIUM** Clayey SAND mottled reddish-brown and brown, loose, moist, fine to medium, with trace hydrocarbon like materials			
	10	■	1	12				19		-200 (38) CON
						SC-CL	Interbedded layers of Clayey SAND and Sandy CLAY brown to black, medium dense to very stiff, moist, fine			
150	15	◪	2	21						
						CL	CLAY dark brown, hard, moist			
	20	■	3	70/1"				22	94	Trace oil odor
						SP	SAND dark brown to black, dense, moist, fine, sticky			
140	25	◪	4	28				6		Hydrocarbon odor and stain
	30	■	5	70/4"			Grades very dense and noticed oil deposits	11	104	
130	35	◪	6	56				5		
	40									

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LOG OF BORING

PROPOSED BROAD CONTEMPORARY ART MUSEUM
LOS ANGELES, CALIFORNIA

FOR: LAC MUSEUM OF ARTS

URS

Report: DMG4: Project File: G:\NESA\PROJECTS\MUSEUM\LACMA2\LACMA.GPJ: Data Template:DMLA.GDT Printed: 11/12/03

LOS ANGELES, CALIFORNIA
FOR: LAC MUSEUM OF ARTS

Boring B-8
Sheet 2 of 2

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	40	■	7	70/8"			Grades very dense			
120	45									
	50									
110	55									
	60									
100	65									
	70									
90	75									
	80									
80	85									
	90									

Report: DMG4; Project File: G:\WESA\PROJECTS\MUSEUM\LACMA2\LACMA.GPJ; Data Template:DMLA.GDT Printed: 11/12/03

Date(s) Drilled	07/17/02	Logged By	Joe Gratzer
Drilling Method	Hollow Stem Auger	Drill Bit Size/Type	8-inch O.D.
Drill Rig Type	B61	Hammer Data	140 lbs, 30-inch drop
Sampling Method(s)	SPT, Dames & Moore Type-U, Bulk		
Approximate Groundwater Depth and Date Measured	Groundwater at 50 feet below the existing ground surface		
Comments	Groundwater was measured immediately after completion of the boring on the same day		

Boring B-1

Sheet 1 of 2

Job Number	59401607.00001
Total Depth Drilled (ft)	51.5
Approximate Ground Surface Elevation(ft)	170 feet MSL

Elevation (ft)	Depth (ft)	SAMPLES Type Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
170	0	BK-1			SC	4-inch thick Asphaltic Concrete Pavement			
						FILL			
		1	29			Clayey SAND dark brown, stiff, moist, fine			CORR -200(48)
					CL	**ALLUVIUM**			
	5	2	17			Sandy to silty CLAY greenish-gray, soft to firm, moist, fine			
		3	33			Grades mottled greenish-gray and dark brown, stiff	26	94	DSCD
					CL	with more sand			CON
160	10	4	28			CLAY dark brown, very stiff, moist, with interlayered fine sand			Slight hydrocarbon odor
					SP	SAND dark gray, dense, moist, fine, with tar, sticky			Hydrocarbon odor
	15	5	64						
150	20	6	86/11"			Grades dark brown to black, very dense			
	25	7	75/5"			Grades black, with trace gravel			
140	30	8	50/5"			Grades with interlayered clay, sticky			
	35	9	50/5"			Grades wet, with less clay			
130	40								

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LOG OF BORING

PROPOSED REPLACEMENT MUSEUM PROJECT
LOS ANGELES, CALIFORNIA
FOR: LAC MUSEUM OF ARTS

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FIGURE 5

Report: DMG4; Project File: G:\NESA\PROJECTS\MUSEUM\LACMA.GPJ; Data Template:DMLA.GDT Printed: 9/5/02

LOS ANGELES, CALIFORNIA
FOR: LAC MUSEUM OF ARTS

Boring B-1
Sheet 2 of 2

Elevation (ft)	Depth (ft)	SAMPLES Type Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
130	40	10	50/5"		SP	SAND black, very dense, moist, fine to medium, with tar, sticky			
	45	11	75/6"						
120	50	12	59			Grades fine to coarse			
	55								
110	60								
	65								
100	70								
	75								
90	80								
	85								
80	90								

Report: DMG4; Project File: G:\NESA\PROJECTS\MUSEUM\LACMA.GPJ; Data Template:DMLA.GDT Printed: 9/5/02

URS

FIGURE 5

Date(s) Drilled	07/24/02	Logged By	Jeff Pyska
Drilling Method	Hollow Stem Auger	Drill Bit Size/Type	8-inch O.D.
Drill Rig Type	B61	Hammer Data	140 lbs, 30-inch drop
Sampling Method(s)	SPT, Dames & Moore Type-U, Bulk		
Approximate Groundwater Depth and Date Measured	Groundwater at 22 feet below the existing ground surface		
Comments	Groundwater was measured immediately after completion of the boring on the same day		

Boring B-2

Sheet 1 of 2

Job Number	59401607.00001
Total Depth Drilled (ft)	86.0
Approximate Ground Surface Elevation(ft)	170 feet MSL

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
170	0	BK	1			SM	5-inch thick Asphaltic Concrete Pavement			
							FILL:			
						CL	Silty SAND brown, moist, fine to coarse, with fine to coarse gravel			CORR
						CL	CLAY dark gray and black, slightly moist, with roots and trace bricks, concrete pieces, and ceremic pieces			
	5		1	24				26	97	-200 (64) DSCD CON
							ALLUVIUM:			
							Sandy to silty CLAY olive-gray, soft to firm, moist, fine, with some black tar deposits			
			2	18			Grades olive-brown Grades white, chalky			
160	10		3	24			Grades bluish-gray, stiff Grades with tar deposits			Slight hydrocarbon odor
	15		4	33		SM/ML	Silty SAND and Sandy SILT dark brown and gray, dense, moist, fine, with tar deposits			Slight hydrocarbon odor
						SM	Silty SAND dark gray and black, dense, wet, fine, with more tar			
150	20		5	39			▽			
	25		6	38						
140	30		7	100/6"			Grades black, very dense, very sticky			
	35		8	50			Grades with trace fine gravel			
130	40									

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LOG OF BORING

PROPOSED REPLACEMENT MUSEUM PROJECT
LOS ANGELES, CALIFORNIA
FOR: LAC MUSEUM OF ARTS

URS

Report: DMG4; Project File: G:\NESA\PROJECTS\MUSEUM\LACMA.GPJ; Data Template:DMLA.GDT Printed: 9/5/02

LOS ANGELES, CALIFORNIA
FOR: LAC MUSEUM OF ARTS

Boring B-2
Sheet 2 of 2

Elevation (ft)	Depth (ft)	Samples Type	Samples Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
130	40	■	9	100/7"		SM	Silty SAND dark black, very dense, wet, fine, with fine to coarse gravel and tar			
	45	◪	10	50/6"						
120	50	■	11	50/4"						
	55	◪	12	50/6"						
110	60	■	13	100/8"			Grades with trace olive-brown clay pockets			
	65	◪	14	50/4"						
100	70	■	15	50/5"						
						CL	CLAY dark olive-gray, hard, moist			
	75	◪	16	50/6"		SM	Silty SAND dark black, very dense, wet, fine, with fine to coarse gravel and tar, trace clay			
90	80	■	17	50/3"		CL	CLAY dark olive-gray, hard, moist, with tar			
	85	◪	18	53			Grades with some black sands			
80	90									

Report: DMG4; Project File: G:\NES\PROJECTS\MUSEUM\LACMA.GPJ; Data Template:DMLA.GDT Printed: 9/5/02

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FIGURE 6

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-121
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 516+36, Rt 14 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/16/2011 - 5/18/2011	4-7/8 inches	177 feet

GROUND-WATER READINGS
Drilling mud bailed. Ground-water level measured at 14 feet below the ground surface.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
											4-inch thick Asphalt Concrete over 7-inch Portland Cement Concrete
175										CL	**FILL [Af]** SANDY LEAN CLAY - moist, brown, fine to medium sand, occasional fine gravel
	5		0.0	24.5	90	Push		⊠			More gravel
170											
	10	23	0.0	29.0	-		3	☒		GP	**LAKEWOOD FORMATION [Qlw]** ***TAR IMPACTED SOILS*** POORLY GRADED GRAVEL with SAND - medium dense, wet, olive brown to bluish gray with light brown mottled, fine to coarse sand, fine gravel (up to 3/4 inch in size), saturated with tar (16%)
165										SP-SM	▼ **SAN PEDRO FORMATION [Qsp]** POORLY GRADED SAND with SILT - medium dense, moist, black to dark brown, fine-grained
	15		0.0	18.0	77	18		⊠			
160										GM	SILTY GRAVEL with SAND - wet, dark reddish brown, fine to coarse sand
	20	24	0.0	13.6	-		59	☒		ML	SANDY SILT - very stiff, moist, black, fine sand, some medium to coarse, occasional gravel (up to 3/8 inch in size), saturated with tar (17%)
155											
	25		0.0	29.3	84	7		⊠			Becomes medium stiff, wet, dark brown
150										SP-SM	POORLY GRADED SAND with SILT - dense, moist, black, fine to medium-grained, moderately infused tar
	30	33	0.0	12.1	-			☒			
145											
	35		0.0	6.9	101	10	7	⊠			Becomes loose, fine-grained, trace medium, saturated with tar (17%)
140											
	40										

Field Tech: HTY
Prepared/Date: YN 6/20/2011
Checked/Date: LT/RM 9/21/2011

(CONTINUED ON FOLLOWING FIGURE)

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.3.4a

LA METRO PB L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\ROTARY WASH GINT LOGS\4953-10-1561_(120-139).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-121 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 516+36, Rt 14 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/16/2011 - 5/18/2011	4-7/8 inches	177 feet

GROUND-WATER READINGS
Drilling mud bailed. Ground-water level measured at 14 feet below the ground surface.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
135									PMT		
	45	56	0.0	8.0	-			☒		GC	CLAYEY GRAVEL with SAND - very dense, moist, black, fine to coarse gravel, moderately infused tar
130										SP	POORLY GRADED SAND - dense, moist, dark brown, fine to medium-grained, saturated with tar
	50	41	0.0	10.2	-			☒			
125										GW	WELL GRADED GRAVEL with SAND - wet, black, fine to coarse gravel, saturated with tar
	55			-	-	13		⊠		SP	POORLY GRADED SAND - medium dense, moist, black, fine to medium-grained, trace gravel, saturated with tar
120										GP	POORLY GRADED GRAVEL with SAND - medium dense, wet, black, fine to coarse, fine sand
	60			-	-	15		⊠			
115											
	65	16	0.0	3.4	-		2	☒			Becomes fine (up to 3/4 inch in size), coarse sand, some fine to coarse sand, slightly infused tar (2%)
110											
	70	23	0.0	6.8	-		8	☒		SW-SM	WELL GRADED SAND with SILT and GRAVEL - medium dense, moist, fine to coarse-grained, fine gravel (up to 1/2 inch in size), slightly infused tar (4%)
105											
	75	53	0.0	25.5	-			☒		ML	SILT with SAND - hard, moist, dark brown, fine sand, moderately infused tar
100											
	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: HTY
Prepared/Date: YN 6/20/2011
Checked/Date: LT/RM 9/21/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.3.4b

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G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\ROTARY WASH GINT LOGS\4953-10-1561_(120-139).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-121 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 516+36, Rt 14 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/16/2011 - 5/18/2011	4-7/8 inches	177 feet

GROUND-WATER READINGS
Drilling mud bailed. Ground-water level measured at 14 feet below the ground surface.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
			0.0	21.5	91	18	77	⊠			Becomes very stiff, some medium sand, saturated with tar (19%)
95											
	85	45	0.0	22.2	-			☒			Becomes hard
90											Trace gravel
	90		0.0	21.4	-	21		⊠		GM	SILTY GRAVEL with SAND - medium dense, wet, dark brown, fine gravel (up to 3/4 inch in size), fine to coarse sand, moderately infused tar, (sample disturbed)
85											
	95	54	0.0	23.5	-		33	☒			Becomes dense, moderately infused tar (11%)
80											
	100		0.0	14.0	-	17		⊠			**FERNANDO FORMATION [Tf]** SILTSTONE - very stiff to hard (Sample disturbed)
75											
	105	62	0.0	24.8	-			☒			More sand
70											
	110		0.0	22.3	88	21		⊠			Less sand
65											END OF BORING AT 111 FEET
	115										
60											
	120										

NOTES:
Hand augered upper 5 feet to avoid damage to utilities.
Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.
"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 380 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings
Downhole Test: PMT = Pressuremeter

Field Tech: HTY
Prepared/Date: YN 6/20/2011
Checked/Date: LT/RM 9/21/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.3.4c

LA METRO PB L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\ROTARY WASH GINT LOGS\4953-10-1561_(120-139).GPJ 9/17/12

BORING M-108

DATE DRILLED: 5/2/2011 - 5/3/2011
EQUIPMENT USED: CME-75, Martini Drilling
HOLE DIAMETER (in.): 11.3
ELEVATION: 189 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
								0.58 feet of Asphalt
								0.75 feet of Base, fine to coarse grained
								0.58 feet of Base, coarse gravel up to 2" in diameter, some cobble sized
							CL/ ML	CLAYEY SILT (cl-ml) - (GLEY1 2.5/N) black, stiff, moist, no odor
185	5							Becomes more clayey
180	10				10	X		CLAYEY SILT (cl-ml) - (GLEY1, 3/2) very dark greenish gray, stiff, moist, weak sulfuric odor
175								Becomes (2.5/1) black, strong hydrocarbon odor
	15				22	X		CLAYEY SILT (cl-ml) - (5Y, 2.5/1) black, very stiff, moist, some asphaltic sand, strong odor
							SM	TAR IMPACTED SOILS, SAN PEDRO FORMATION (Qsp) SILTY SAND (sm) - (5Y, 2.5/1) black, damp, fine grained, asphaltic tar sand
170	20				20	X	ML	SILT (ml) - (GLEY1, 3/N) very dark gray, very stiff, moist, strong odor
165	25				15	X		CLAYEY SILT (cl-ml) - (5Y, 2.5/1) black, stiff, moist, strong odor
160	30				9	X		Becomes (GLEY1, 3/N) very dark greenish gray
							SP	
155	35				22	X		FINE TAR SAND (sp) - (5Y, 2.5/1) black, medium dense, damp to wet, some silt, fine grained, strong odor
150	40							

Field Geol: PK & RM
Prepared By: KP

(CONTINUED ON FOLLOWING FIGURE)

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B2SOIL_AMEC_PID G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\4953-10-1561_NEUHAUS_OCT 21 2011.GPJ 5/21/13

BORING M-108 (Continued)

DATE DRILLED: 5/2/2011 - 5/3/2011
EQUIPMENT USED: CME-75, Martini Drilling
HOLE DIAMETER (in.): 11.3
ELEVATION: 189 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
					44	X		Same as above
145								
	45				45	X		Same as above
							ML	
140								
	50				45	X		PETROLIFEROUS SILT (ml) - (5Y, 2.5/1) black, hard, damp, strong odor
135								
	55				69	X		Same as above
130								
	60				61	X		Same as above
							ML	
125								
	65				31	X		CLAYEY SILT (cl-ml) - (5Y, 2.5/1) black, hard, moist, some tar, strong odor
							ML	
120								
	70				50/2"	X		SILTSTONE (ml) - dark greenish gray, strongly indurated
115								
	75							
110								
	80							

NOTES:
Total depth = 71 feet bgs, refusal
Groundwater measured at 35 feet bgs
Hand augered to 5 feet bgs
The boring was initialy drilled with 8-inch O.D. augers and later reamed with 11.25-inch O.D. augers.
Soil samples collected using an SPT sampler.
After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: PK & RM
Prepared By: KP

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B2SOIL_AMEC_PID G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\4953-10-1561_NEUHAUS_OCT 21 2011.GPJ 5/21/13

BORING M-109

DATE DRILLED: 5/10/2011 - 5/12/2011
EQUIPMENT USED: CME-75, Martini Drilling
HOLE DIAMETER (in.): 8.5
ELEVATION: 185 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
								0.58 feet of Asphalt 0.75 feet of Base
							SM	
180	5							
175	10			0.0	21	X		SILTY SAND (sm) - (10YR, 3/3) dark brown, medium grained, tar odor
							ML	
170	15			0.0	17	X		CLAYEY PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist, hydrocarbon odor Driller notes perched water zone at approximately 15 feet due to wet sample rod.
165	20			0.0	23	X		TAR IMPACTED SOILS Same as above, oil stringers
160	25			0.0	20	X		Same as above
							SP	
155	30			0.0	50/6"	X		TAR SAND (sp) - (10YR, 2/2) very dark brown, sticky, saturated with tar, fine to medium grained
150	35			0.0	29	X		Same as above
	40							

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Geol: RM
Prepared By: KP

(CONTINUED ON FOLLOWING FIGURE)

BORING M-109 (Continued)

DATE DRILLED: 5/10/2011 - 5/12/2011
EQUIPMENT USED: CME-75, Martini Drilling
HOLE DIAMETER (in.): 8.5
ELEVATION: 185 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
				0.0	34			Same as above
140	45			0.0	41			Same as above
135	50			0.0	68			Same as above Broken shale fragments present at 51 feet
130	55			0.0	87/10.5"			Same as above, no shale fragments present
							SM/ ML	
125	60			0.0	64			PETROLIFEROUS SILT (ml) to SILTY SAND (sm) - (10YR, 2/2) very dark brown, fine grained sand
							SP	TAR SAND (sp) - (10YR, 2/2) very dark brown, fine to medium grained
120	65			0.0	55		ML	PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist, wood chip/fragment at 66 feet
115	70			0.0	27			Same as above, tar pods present
							CL	
110	75			0.0	38			SILTY PETROLIFEROUS CLAY (cl) - (10YR, 2/2) very dark brown, slightly moist, tar pods present, shale fragments at bottom of sampler
	80							

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Geol: RM
Prepared By: KP

(CONTINUED ON FOLLOWING FIGURE)

BORING M-109 (Continued)

DATE DRILLED: 5/10/2011 - 5/12/2011
EQUIPMENT USED: CME-75, Martini Drilling
HOLE DIAMETER (in.): 8.5
ELEVATION: 185 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
				0.0	31	X	ML	Same as above, no shale fragments present
100	85			0.0	32	X		CLAYEY PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist, tar pods present
95	90			0.0	27	X		Same as above
90	95			0.0	29	X		Same as above, no tar pods present (not noted)
85	100			0.0	25	X		Same as above
80	105							
75	110							
70	115							
	120							

NOTES:
Total depth = 101.5 feet bgs
Groundwater apparently not encountered
Hand augered to 6 feet bgs
Backfilled with hydrated bentonite chips
Groundwater sample taken using disposable PVC casing and bailer.

Field Geol: RM
Prepared By: KP

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B2SOIL_AMEC_PID G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\4953-10-1561_NEUHAUS_OCT 21 2011.GPJ 5/21/13

BORING E-114A

DATE DRILLED: July 17, 2012
EQUIPMENT USED: CME 75
HOLE DIAMETER (in.): 8
ELEVATION: 169**

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD. PEN. TEST	PID (ppm)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							6-inch asphalt concrete over 5-inch concrete
						CL-ML	**LAKEWOOD FORMATION (Qlw)** SILTY CLAY - moist, black, some fine sand
165	5						
160	10					ML	SANDY SILT - moist, greenish gray (GLEY1 2.5/1)
155	15						
						SM	***TAR IMPACTED SOILS*** SILTY SAND - moist, black (GLEY1 2.5/N), fine grained, some clay, trace tar
150	20		3.0				
145	25						No clay
						SP-SM	**SAN PEDRO FORMATION (Qsp)** POORLY GRADED SAND with SILT - moist, black (GLEY1 2.5/N), fine grained
140	30		51.3				
135	35						
						SM	SILTY SAND - moist, black (GLEY1 2.5/N), fine-grained, trace medium to coarse
130	40						

Field Tech: PK
Prepared By: PWK
Checked By: PK

(CONTINUED ON FOLLOWING FIGURE)

BORING E-114A (Continued)

DATE DRILLED: July 17, 2012
EQUIPMENT USED: CME 75
HOLE DIAMETER (in.): 8
ELEVATION: 169**

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD. PEN. TEST	PID (ppm)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
			32.6				
125	45		29.4				
120	50		17.5			SP-SM	POORLY GRADED SAND with SILT - moist, black (GLEY1 2.5/N), fine-grained
115	55		27.0			SM	SILTY SAND - moist, black (GLEY1 2.5/N), fine grained
110	60		82.1				
105	65		43.1			ML	SILT
100	70		162.0				Less tar
95	75		132.0			SW	WELL GRADED SAND - moist, black (GLEY1 2.5/N), fine to coarse-grained
						ML	SILT - moist, black, fine sand
90	80		140.0				Becomes dark olive gray, some clay, trace tar END OF BORING AT 80 FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

Groundwater was not measured at the time of drilling.

**Elevations based on topographic map provided by PB on 8/22/2012

Field Tech: PK
Prepared By: PWK
Checked By: PK

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING
Project: 4953-11-1421 Figure: A-3.2.1b

METRO ENVIRO "N" L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT DIRECTORIES\4953\2011\111421 WESTSIDE - APE\3.2 ALL FIELD NOTES\GINT LOG\ENVIRONMENTAL\4953-11-1421 ENVIRONMENTAL.GPJ 10/12/12

BORING E-114B

DATE DRILLED: July 17, 2012
EQUIPMENT USED: CME 75
HOLE DIAMETER (in.): 8
ELEVATION: 167**

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD. PEN. TEST	PID (ppm)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							6-inch asphalt concrete over 5-inch concrete
165						CL-ML	**FILL [Af]** SILTY CLAY - moist, mottled
	5						
160							
	10					ML	**LAKEWOOD FORMATION** SANDY SILT - very stiff, moist, dark yellowish brown
155		18					
	15					CL	LEAN CLAY - moist, dark olive gray, trace silt
150						SM	SILTY SAND - very dense, moist, dark greenish gray (GLEY1 4/1), some clay, hydrogen-sulfide oder, with tar stains
	20	79	11.2				Becomes greenish black
145							
	25						
140							
	30	69	63.7			SP-SM	***TAR IMPACTED SOILS*** **SAN PEDRO FORMATION (Qsp)** POORLY GRADED SAND with SILT - very dense, moist, black (GLEY1 2.5/N), fine grained, trace clay
135							
	35						
130							
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK
Prepared By: PWK
Checked By: PK

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING
Project: 4953-11-1421 Figure: A-3.2.2a

METRO ENVIRO "N" L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT DIRECTORIES\4953\2011\111421 WESTSIDE - APE\3.2 ALL FIELD NOTES\GINT LOG\ENVIRONMENTAL\4953-11-1421 ENVIRONMENTAL.GPJ 10/12/12

BORING E-114B (Continued)

DATE DRILLED: July 17, 2012
EQUIPMENT USED: CME 75
HOLE DIAMETER (in.): 8
ELEVATION: 167**

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD. PEN. TEST	PID (ppm)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
		82	64.4				
125							
	45	50/4"	72.6				
120						SP-SM	POORLY GRADED SAND with SILT - very dense, moist, black (GLEY1 2.5/N), fine-grained
	50	50/4"	30.5				
115							
	55	71	84.9				
110						SP	POORLY GRADED SAND - very dense, moist, black (GLEY1 2.5/N), medium to coarse-grained
	60	85	169.0				
105						ML	SILT - very stiff to hard, moist, black (GLEY1 2.5/N), trace fine sand, some clay
	65	30	57.2				
100							Less tar
	70	48	56.9				
95						SM/SP	SILTY SAND to POORLY GRADED SAND - very dense, moist, black (GLEY1 2.5/N), fine to medium-grained
	75	64	56.2				
90							
		28	130.0			ML	SILT - very stiff, moist, black (GLEY1 2.5/N), some clay
	80						

Field Tech: PK
Prepared By: PWK
Checked By: PK

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING
Project: 4953-11-1421 Figure: A-3.2.2b

METRO ENVIRO "N" L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT DIRECTORIES\4953\2011\111421 WESTSIDE - APE\3.2 ALL FIELD NOTES\GINT LOG\ENVIRONMENTAL\4953-11-1421 ENVIRONMENTAL.GPJ 10/12/12

BORING E-114B (Continued)

DATE DRILLED: July 17, 2012
EQUIPMENT USED: CME 75
HOLE DIAMETER (in.): 8
ELEVATION: 167**

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD. PEN. TEST	PID (ppm)	BLOW COUNT* (blows/ft)	SAMPLE LOC.
85					
	85				
80					
	90				
75					
	95				
70					
	100				
65					
	105				
60					
	110				
55					
	115				
50					
	120				

END OF BORING AT 80 FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

Groundwater was not measured at the time of drilling.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

**Elevations based on topographic map provided by PB on 8/22/2012

Field Tech: PK
Prepared By: PWK
Checked By: PK

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

METRO ENVIRO "N" L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT DIRECTORIES\4953\2011\111421 WESTSIDE - APE\3.2 ALL FIELD NOTES\GINT LOG\ENVIRONMENTAL\4953-11-1421 ENVIRONMENTAL.GPJ 10/12/12

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LOG OF BORING
Project: 4953-11-1421 Figure: A-3.2.2c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-105**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	508+89, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/7/11, 4/8/11 and 4/11/11	6 inches	188 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
									6-inch thick Asphalt Concrete over 8-inch thick Portland Cement Concrete and no Base Coarse
								CL-ML	**FILL [Af]** SILTY CLAY - moist, grayish brown, trace rock
185									**QUATERNARY OLDER ALLUVIUM [Qalo]**
								CH	FAT CLAY - moist, dark gray black
								CL-ML	SILTY CLAY - moist, light gray to black, trace sand, gravel
	5							CL	LEAN CLAY - moist, light grayish green, medium plastic
									Becomes light grayish green, trace sand, medium plastic
									No Core Recovery from 7.0 to 7.5 feet
								SP	***TAR IMPACTED SOILS*** POORLY GRADED SAND - dense, moist, light gray (5Y 7/2) to greenish gray, coarse grained, tar around clean core
180									**SAN PEDRO FORMATION [Qsp]**
								CL	SANDY LEAN CLAY - medium stiff to stiff, moist, black, fine to medium sand, slightly to moderate tar
	10							SM	SILTY SAND - dense to very dense, moist, black, fine to medium grained, some calcium carbonate nodules
		1	1	85	8.9	13			Moderately infused tar (11%)
									No Core Recovery from 12.0 to 13.0 feet
175								ML	SANDY SILT - stiff, moist, black, fine sand, saturated with tar
					4.6				
	15							SM	SILTY SAND - dense to very dense, moist, black, fine to medium grained, occasional gravel (up to 3/8 inch in size), moderately infused tar
									Layer of Silt, hard, moist, black, some clay
					6.7	15			Moderately infused tar (12%)
170									
								ML	SILT - stiff, moist, black, trace fine grained, moderately infused tar
	20								

(CONTINUED ON FOLLOWING FIGURE)

Logged By: RH
Prepared/Date: DR/WL 9/28/2011
Checked/Date: LT/PE 9/28/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-0161 Figure: B-1.1.2a

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (101-110).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-105 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	508+89, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/7/11, 4/8/11 and 4/11/11	6 inches	188 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
		2	2	95	17.8		ML	Becomes hard, dark brown to black, trace coarse gravel, moderately infused tar
165								
	25							
					23.4	46	SM	SILTY SAND - medium dense, moist, black to dark brown, fine to medium grained, saturated with tar (20%)
					23.4			
160								
	30							Moderately infused tar
		3	3	95	3.4	9	SP-SM	POORLY GRADED SAND with SILT - dense, moist, black, fine to medium grained, trace coarse, trace fine gravel (up to 3/4 inch in size), moderately infused tar (14%)
155								
	35							Trace coarse gravel (up to 3 inches in size)
								More silt
								No Core Recovery from 37.0 to 38.0 feet
150					2.0			
								More gravel, fine to coarse (up to 3 inches in size)
	40							

Logged By: RH
Prepared/Date: DR/WL 9/28/2011
Checked/Date: LT/PE 9/28/2011

(CONTINUED ON FOLLOWING FIGURE)

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Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.2b

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (101-110).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-105 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	508+89, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/7/11, 4/8/11 and 4/11/11	6 inches	188 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
		4	4	95	2.1			SP-SM	Less gravel Becomes saturated with tar (17%)
145	45				2.4				
140	50		5	100	2.1			SM	SILTY SAND - medium dense to dense, moist, black, fine to medium grained, saturated with tar
			6	90	2.3	8		SP-SM	POORLY GRADED SAND with SILT and GRAVEL - medium dense to dense, moist, black, fine to medium grained, some coarse, fine gravel (up to 3/4 inch in size), moderately infused tar (11%)
135								SM	SILTY SAND - medium dense to dense, moist, black, fine to coarse grained, moderately infused tar
	55				1.5			SW	WELL GRADED SAND - dense, moist, black, fine to coarse grained, fine to coarse gravel, moderately infused tar
								SM	SILTY SAND - dense, moist, black, fine to coarse grained, moderately infused tar
					2.5	10		SW-SM	WELL GRADED SAND with SILT - dense, moist, black, fine to coarse grained, trace fine gravel (up to 3/8 inch in size), moderately infused tar (12%)
130			7	100				ML	SANDY SILT - medium stiff, moist, black, fine sand, moderately infused tar
	60								

Logged By: RH
Prepared/Date: DR/WL 9/28/2011
Checked/Date: LT/PE 9/28/2011

(CONTINUED ON FOLLOWING FIGURE)

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Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-0161 Figure: B-1.1.2c

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (101-110).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-105 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	508+89, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/7/11, 4/8/11 and 4/11/11	6 inches	188 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
					5.8		ML	
125					5.0			**FERNANDO FORMATION [Tf]** SANDY SILTSTONE - hard, moist, very dark grayish brown, fine to medium sand, slightly to moderately infused tar
	65		8	100	21.5			
120			9	100				Becomes very dark brown to black
	70		10	100	20.0			
115			11	100	19.8	67		About 6-inch thick layer of Sandy Siltstone, saturated with tar (19%)
	75				17.6			
110			12	100	19.1			
	80							

(CONTINUED ON FOLLOWING FIGURE)

Logged By: RH
Prepared/Date: DR/WL 9/28/2011
Checked/Date: LT/PE 9/28/2011

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.2d

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (101-110).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-105 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	508+89, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/7/11, 4/8/11 and 4/11/11	6 inches	188 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
								About 6-inch thick layer of Sandy Siltstone, black, saturated with tar, less sand
					20.1	75		Saturated with tar (18%)
105			13	100				
	85				19.5			
100			14	100				
	90				22.4			
95			15	100				
	95				21.0	79		Less sand, saturated with tar (19%)
90			16	100				
	100							

(CONTINUED ON FOLLOWING FIGURE)

Logged By: RH
Prepared/Date: DR/WL 9/28/2011
Checked/Date: LT/PE 9/28/2011

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.2e

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (101-110).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-105 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	508+89, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/7/11, 4/8/11 and 4/11/11	6 inches	188 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
					19.0			
85								
	105							
80								
	110							
75								
	115							
70								
	120							

END OF BORING AT 102 FEET

NOTES:

Consistency description on this log is based on pocket penetrometer test results and/or visual observation of soil samples.

Hand augered upper 7 feet to avoid damage to utilities.

Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

Logged By: RH
Prepared/Date: DR/WL 9/28/2011
Checked/Date: LT/PE 9/28/2011

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LOG OF BORING

Project No.: 4953-10-0131 Figure: B-1.1.2f

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (101-110).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-116**
DRILLING METHOD Sonic Coring	**BOREHOLE LOCATION** 512+50, Lt 17 feet	
DATES DRILLED 4/11/11 and 4/12/11	**HOLE DIAMETER** 6 inches	**GROUND EL.** 185 feet
GROUND-WATER READINGS Ground-water level not measured.		

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
									12-inch thick Asphalt Concrete over 4 inch thick Portland Cement Concrete, 2-inch thick Base Course
								CL-ML	**FILL [Af]** SILTY CLAY - moist, blueish-gray, trace black gravel, trace orange brick fragments (less than 4 inches in size)
180	5								
									No Core Recovery from 7 to 9 feet
								CL	**QUATERNARY OLDER ALLUVIUM [Qalo]** ***TAR IMPACTED SOILS*** LEAN CLAY with SAND - stiff to medium stiff, wet, dark greenish gray (5G 3/1) with black to dark brown tar spots, fine to coarse sand, trace fine to coarse gravel (up to 1 inch in size), some calcium carbonate nodules, tar content increases with depth, some Sandy Clay seams
175	10	1	1	80					
								ML	**SAN PEDRO FORMATION [Qsp]** SANDY SILT - hard, moist, dark brown to black, trace fine gravel, slightly to moderately infused tar
								ML	SILT with SAND - hard, moist, dark brown to black, varying shades of dark greenish gray, fine to medium sand, slightly to moderately infused tar
170	15								
					13.1				Layers of Sandy Silt
									No Core Recovery between 17 to 18 feet
					3.3			SP-SM	POORLY GRADED SAND with SILT - dense, moist, fine to medium-grained, saturated with tar (19%)
	20								

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Logged By: RS/RH
Prepared/Date: YN/WL 9/29/2011
Checked/Date: LT/PE 9/29/2011

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-1361 Figure B-1.1.3a

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-116 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	512+50, Lt 17 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/11/11 and 4/12/11	6 inches	185 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
		2	2	90	15.2			ML	SANDY SILT - hard, moist, dark brown to black, shades of dark greenish gray, moist, slightly to moderately infused tar
									Less sand, some clay
160	25								
									No Core Recovery between 27 to 29 feet
					5.3			SP-SM	POORLY GRADED SAND with SILT - medium dense to dense, moist, dark greenish gray, fine to medium grained, saturated with tar
155	30	3	3	80					
150	35				3.1				
									No Core Recovery between 37 to 38 feet
					2.3	6			Becomes fine grained, some medium and coarse, saturated with tar (17%)
	40								

Logged By: RS/RH
Prepared/Date: YN/WL 9/29/2011
Checked/Date: LT/PE 9/29/2011

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0101 Figure: B-1.1.3b

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-116 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	512+50, Lt 17 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/11/11 and 4/12/11	6 inches	185 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
		4	4	90				SP-SM	Trace fine slate gravel
					3.9				Trace fine to coarse gravel (up to 1½ inches in size), subrounded
140	45								
					5.2	16			Layer of Silty Sand, fine grained, occasional medium and coarse, trace gravel (up to 3/8 inch in size), saturated with tar (18%)
		5	5	100					Trace fine gravel
135	50								
					4.1				Saturated with tar (17%)
					5.9				More fine to coarse gravel (up to 2½ inches in size), fine to coarse sand
		6	6	100					No gravel, fine to medium sand
130	55								
					1.5				Fine to coarse sand, trace fine to coarse gravel
					1.1	13		SM	SILTY SAND with GRAVEL - moist, dark gray, fine to medium grained, moderately infused tar (12%)
		7	7	100				ML	SANDY SILT - wet, black, fine sand, saturated with tar
	60								

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Prepared/Date: YN/WL 9/29/2011
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(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0101 Figure B-1.1.3c

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-116 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	512+50, Lt 17 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/11/11 and 4/12/11	6 inches	185 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
					4.8		ML	
					5.1			Trace fine gravel, saturated with tar (18%)
		8	8	100	4.4			
120	65							Some shell fragments
					15.0			**FERNANDO FORMATION [Tf]** SILTSTONE with Sand - hard, moist, dark brown, fine sand, fine to medum sands, slightly to moderately infused tar
		9	9	100				
115	70				19.1			
		10	10	100				
110	75				12.1	78		Saturated with tar (20%)
								No Core Recovery from 77.7 to 78.2 feet
		11	11	95	19.6			Thin layer of Silty Sand, moist, black, medium to coarse grained, saturated with tar
	80							

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.3d

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-116 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	512+50, Lt 17 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/11/11 and 4/12/11	6 inches	185 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
					16.1	77		Saturated with tar (23%)
		12	12	96				No Core Recovery from 84 to 87 feet
100	85				13.8			
								No Core Recovery from 87.3 to 87.6 feet
								No Core Recovery from 88.5 to 88.6 feet
		13	13	94	9.9			
95	90				15.4	80		Saturated with tar (18%)
					20.5			
		14	14	96				
90	95							No Core Recovery from 95.1 to 95.3 feet
					25.5			
					11.3			Saturated with tar (17%)
		15	15	100				
	100							

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Prepared/Date: YN/WL 9/29/2011
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(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.3e

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
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DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-116 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	512+50, Lt 17 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/11/11 and 4/12/11	6 inches	185 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
					17.1	76		Saturated with tar (19%)
								No Core Recovery from 102.2 to 102.4 feet and from 102.5 to 102.7 feet
		16	16	92	20.8			
80	105							
					19.2	77		Saturated with tar (19%)
75	110							
70	115							
	120							

END OF BORING AT 107 FEET

NOTES:

Consistency description on this log is based on pocket penetrometer test results and/or visual observation of soil samples.

Hand augered upper 7 feet to avoid damage to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

This boring was originally planned as a rotary wash boring G-120, converted to sonic core boring.

Logged By: RS/RH
Prepared/Date: YN/WL 9/29/2011
Checked/Date: LT/PE 9/29/2011

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LOG OF BORING
Project No.: 4953-10-0361 Figure: B-1.1.3f

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G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-117**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	521+50, Lt 18 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/14/11 - 4/18/11	6 inches	167 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
									12 inch thick Asphalt Concrete over 6 inch thick Base Course
165								ML	**LAKEWOOD FORMATION [Qlw]** SILT - moist, dark brown, some clay
								CL-ML	SILTY CLAY - moist, dark brown
	5								
								SC	***TAR IMPACTED SOILS*** CLAYEY SAND - fine grained, tar content
160									
									Becomes brown
	10								
					20.8			ML	SANDY SILT - medium stiff, moist, olive (5Y 5/4), fine to medium sand, non-plastic
155									
					22.3				
		1	1	96					Pockets of tar sand, slightly infused tar, black, dark greenish gray (5G 4/1)
	15								Moderately infused tar (13%), black (5Y 25/1)
					14.5				
150									No Core Recovery between 17 to 18 feet
					6.8			SM	SILTY SAND - dense, moist, black, fine grained, some medium to coarse, moderately infused tar
	20								

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(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.4a

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-117 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	521+50, Lt 18 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/14/11 - 4/18/11	6 inches	167 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
		2	2	90			SM	Becomes very dark brown, slightly infused tar
145					5.8	13		Fine grained, occasional medium to coarse, non-plastic, saturated with tar (16%)
	25							
140								**SAN PEDRO FORMATION [Qsp]** No Core Recovery from 27 to 29 feet
							SP-SM	POORLY GRADED SAND with SILT- dense, moist, black, fine to medium grained, trace medium to fine gravel, saturated with tar
	30				2.4			
		3	3	90				
135								More gravel (up to 1 inch in size)
	35							Becomes medium to coarse grained
					2.8	11		Fine grained, some medium, trace coarse, occasional gravel (up to 3/8 inch in size), saturated with tar (16%)
130					2.0			
		4	4	80	5.4	15	SM	SILTY SAND - medium dense, moist, black, fine grained, occasional medium to coarse, fine subrounded slate gravel (up to 3/8 inch in size), alternating layers of Clayey Sand, saturated with tar (18%)
	40							

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0101 Figure: B-1.1.4b

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-117 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	521+50, Lt 18 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/14/11 - 4/18/11	6 inches	167 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
							SM	
125								
		5	5	100	4.8			Gravel (up to 1 inch in size)
	45							
120					3.1	11	SP-SM	POORLY GRADED SAND with SILT - dense, moist, black, fine to coarse grained, moderately infused tar (14%) Becomes medium to coarse grained
		6	6	100				Becomes fine to coarse grained, trace silt
	50				2.2			
115								Becomes coarse grained
		7	7	100	2.9			
	55				2.1	9		Fine to coarse grained, trace gravel (up to ½ inch in size), moderately infused tar (13%)
110							SM	SILTY SAND - dense, moist, black, fine to medium grained, trace fine gravel, saturated with tar, small shell fragments, some clay
		8	8	100				
	60							

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(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0101 Figure: B-1.1.4c

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
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DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-117 (Continued)**
DRILLING METHOD Sonic Coring	**BOREHOLE LOCATION** 521+50, Lt 18 feet	
DATES DRILLED 4/14/11 - 4/18/11	**HOLE DIAMETER** 6 inches	**GROUND EL.** 167 feet
GROUND-WATER READINGS Ground-water level not measured.		

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
								SM	
105					5.4	41			Fine grained, occasional medium; no gravel, non-plastic, saturated with tar (18%)
		9	9	100	4.1			SP	POORLY GRADED SAND - dense, moist, black, medium to coarse grained, trace silt, trace fine to medium gravel, saturated with tar, shell fragments, moderately infused tar (10%)
	65								
								ML	SILT - hard, moist, black and dark brown(10YR 2/2), trace fine sand, moderately infused tar, large shell fragments Becomes very dark brown (10YR 2/2)
100					10.2	94			Saturated with tar (20%)
		10	10	100					
	70								Less sand
95					14.0				
		11	11	100					
	75								Some shell fragments
90					11.7				**FERNANDO FORMATION [Tf]** SILTSTONE - hard, moist, very dark brown (10YR 2/2), trace fine sand
		12	12	100					
	80								

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

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(CONTINUED ON FOLLOWING FIGURE)

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Appendix B
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LOG OF BORING
Project No.: 4953-10-1561 Figure B-1.1.4d
Figure B-45

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-117 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	521+50, Lt 18 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/14/11 - 4/18/11	6 inches	167 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
85	85	13	13	100	12.0			
80	90	14	14	100	25.7			Layer of Sandstone, fine to medium sand, occasional gravel (up to 3/8 inch in size)
75	95	15	15	100	25.6	96		Trace fine sand, saturated with tar (18%)
70	100	16	16	100	21.0			

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.4e

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-117 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	521+50, Lt 18 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
4/14/11 - 4/18/11	6 inches	167 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
65								END OF BORING AT 102 FEET
	105							
60								
	110							
55								
	115							
50								
	120							

NOTES:

Consistency description on this log is based on pocket penetrometer test results and/or visual observation of soil samples.

Hand augered upper 11 feet to avoid damage to utilities.

Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

This boring was originally planned as a rotary wash boring G-122, converted to sonic core boring.

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LOG OF BORING

Project No.: 4953-10-0361 Figure: B-1.1.4f

METRO SOIL CORE MC 200 L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\SONIC CORE GINT LOGS\101561 SONIC (111-120).GPJ 9/17/12

JOB 70131.70548.0002 DATE 1/21/1998 F.T. GMC DR. O.E. MS CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 1

DATE DRILLED: January 7, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 173**

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.		
						CL	FILL - SILTY CLAY - some Sand, some pieces of brick, light brown
		18.4	84	25	■		SURFACE OF NATURAL SOIL SANDY CLAY light brown
170						CL	
		20.3	93	17	■	CL	SILTY CLAY - light grey
	5						
		24.3	95	58	■		

END OF BORING AT 6'.

NOTE: Water not encountered.

* Number of blows required to drive the Crandall sampler 12 inches using a 140 pound hammer falling 30 inches.

** Elevations refer to datum of reference survey; see Figure 1

LOG OF BORING

LAW/CRANDALL

FIGURE 2.1

JOB 70131.70548.0002 DATE 1/21/1998 F.T. GMC DR. O.E. MS CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 2

DATE DRILLED: January 7, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 174

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.		
						CL	SILTY CLAY - some caliche, light grey
		26.9	89	18	■		
						CL	SANDY CLAY - white to light grey
170		21.2	106	11	■		END OF BORING AT 4'.
							NOTE: Water not encountered.

LOG OF BORING

LAW/CRANDALL

FIGURE 2.2

BORING 3

DATE DRILLED: January 7, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 174

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of cry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.			
		26.4	94	15	■		CL	SILTY CLAY - dark brown to black
170		30.8	81	17	■		CL	SANDY CLAY - white to light grey
	5	21.7	105	18	■			END OF BORING AT 6'.
								NOTE: Water not encountered.

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated.
It is not warranted to be representative of subsurface conditions at other locations and times.

JOB 70131.70548.0002 DATE 1/21/1998 F.T. GMC DR. O.E. MS CHKD MS

LOG OF BORING

LAW/CRANDALL

FIGURE 2.3

JOB 70131.70548.0002 DATE 1/21/1998 F.T. GMC DR. O.E. MS CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated.
It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 4

DATE DRILLED: January 7, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 173

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.			
							CL	SILTY CLAY - dark brown to black
		18.5	95	47	■			
170		23.3	85	22	■			
	5	21.4	106	16	■			
								END OF BORING AT 6'.
								NOTE: Water not encountered.

LOG OF BORING

LAW/CRANDALL

FIGURE 2.4

BORING 5

DATE DRILLED: January 7, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 171

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of cry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.			
170		25.0	93	20	■		CL	SILTY CLAY - dark grey to black
		31.9	88	23	■			Some Sand
	5							
165		34.8	88	20	■			Light grey END OF BORING AT 6'.

NOTE: Water seepage encountered at a depth of 4'.

JOB 70131.70548.0002 DATE 1/21/1998 F.T. GMC DR. O.E. MS CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated.
It is not warranted to be representative of subsurface conditions at other locations and times.

LOG OF BORING

LAW/CRANDALL

FIGURE 2.5

JOB 70131.70548.0002 DATE 1/21/1998 F.T. GMC DR. O.E. MS CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated.
It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 6

DATE DRILLED: January 7, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 169

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.		
						CL	FILL - SILTY CLAY - mottled brown and grey
							SURFACE OF NATURAL SOIL
		24.2	99	20	■	CL	SILTY CLAY - some rootlets, dark grey to black
165		21.9	88	28	■		
	5	29.5	67	30	■		Layer of Asphaltic Sand
							END OF BORING AT 6'.
							NOTE: Water not encountered.

LOG OF BORING

LAW/CRANDALL

FIGURE 2.6

JOB 70131.70548.0002 DATE 1/21/1998 FT. GMC DR. O.E. MS CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 7

DATE DRILLED: January 7, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 178

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.		
		21.1	98	12	■	CL	FILL - SILTY CLAY - mottled brown and grey
							↓ SURFACE OF NATURAL SOIL
175						CL	SILTY CLAY - some caliche, grey
		26.1	94	12	■		
						ML	CLAYEY SILT - dark grey to black
	5	33.4	76	7	■		
							END OF BORING AT 6'.

NOTE: Slight water seepage encountered at a depth of 6'.

LOG OF BORING

LAW/CRANDALL

FIGURE 2.7

BORING 8

DATE DRILLED: January 6, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 182

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.		
						CL	FILL - SANDY CLAY - mottled grey and dark grey
180		25.1	101	21	■		SURFACE OF NATURAL SOIL
						CL	SANDY CLAY dark greysih brown
		25.0	87	42	■		
	5						
		17.7	109	14	■		Some roots, light grey
175							
		22.0	74	16 for 9"	■		Layer of Asphaltic Sand
							END OF BORING AT 8'.
							NOTE: Water not encountered.

DB 70131.70548.0002 DATE 1/21/1998 F.T. GMC DR. O.E. MS CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

LOG OF BORING

LAW/CRANDALL

FIGURE 2.8

JB 70131.70548.0002 DATE 1/21/1998 FT. GMC DR. O.E. MS CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 9

DATE DRILLED: January 6, 1998
EQUIPMENT USED: 8" - Diameter Hollow Stem Auger
ELEVATION: 184

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE LOC.		
		29.9	77	38	■	CL	FILL - SANDY CLAY - some pieces of decayed vegetation and roots, dark brown to black
							↓ SURFACE OF NATURAL SOIL
						CL	SANDY CLAY - dark brown
180		27.6	64	16	■		
	5						Large Cobble
		28.2	82	16	■	CL	SILTY CLAY - some organics, black
175		38.6	79	29	■		END OF BORING AT 9'.

NOTE: Water seepage encountered at a depth of 5½'.

LOG OF BORING

LAW/CRANDALL

FIGURE 2.9

JB 2661.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 1

DATE DRILLED: January 26, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
	39.7	75	16	■	CL	FILL - SILTY CLAY - few rootlets, dark grey to black
						SURFACE OF NATURAL SOIL
	25.7	95	25	■	CL	SILTY CLAY - some asphalt, light grey and black
5	24.8	95	40	■		END OF BORING AT 6'

* Number of blows required to drive the Crandall sampler 12 inches using a 50 pound hammer falling 12 inches.

NOTE: Slight water seepage encountered at a depth of 1'. No caving.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.1

BORING 2

DATE DRILLED: January 23, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
					CL	FILL - SILTY CLAY - dark grey to black
	53.2	60	35	■		
	54.2	60	70 for 10"	■		SURFACE OF NATURAL SOIL SANDY CLAY - some asphalt, light grey
5					CL	
	26.6	89	70	■		
	19.8	111	35	■		
10	21.4	107	40	■		END OF BORING AT 10'

NOTE: Slight water seepage encountered at a depth of 4'. Water level measured at a depth of 4½' after completion of drilling. No caving.

JB 2661.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.2

JB 2001.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 3

DATE DRILLED: January 23, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
	39.0	81	16	■	CL	FILL - SILTY CLAY - few rootlets and brick fragments, dark grey to black
					CL	SURFACE OF NATURAL SOIL SANDY CLAY - light grey
5	22.1	103	35	■		
	23.7	101	45	■	SC	CLAYEY SAND - fine to medium, light brownish grey
10	25.3	94	60	■		END OF BORING AT 10'

NOTE: Water seepage encountered at a depth of 7'. Water level measured at a depth of 7' 10 minutes after completion of drilling. No caving.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.3

JOB 2661.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 4

DATE DRILLED: January 23, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
	40.3	72	30	■	CL	FILL - SILTY CLAY - some Sand, some rootlets and pieces of brick, dark grey to black
	34.8	78	45	■		
5						SURFACE OF NATURAL SOIL
	22.6	101	35	■	CL	SILTY CLAY - some Sand, light grey
	19.0	106	35	■	CL	SANDY CLAY - some asphalt, light grey and black
10	27.0	80	60	■		END OF BORING AT 10'

NOTE: Water not encountered. No caving.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.4

JOB 2661.40813.0001 DATE 2/14/1995 F.T. AR DR. O.E. JB CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 5

DATE DRILLED: January 24, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
	40.2	60	15	■	CL	FILL - SANDY CLAY - some asphalt, light brown and grey Cemented layer
	29.6	76	50	■		Some pieces of cemented asphalt SURFACE OF NATURAL SOIL
5					SP	ASPHALTIC SAND - fine to coarse, brownish grey
	13.2	112	100	■		
	11.4	116	100	■		END OF BORING AT 8'

NOTE: Water seepage encountered on top of concrete slab at a depth of 1'. Water level measured at a depth of 4'after completion of drilling. No caving.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.5

BORING 6

DATE DRILLED: January 27, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
						4½" Asphaltic Paving - 5" Sand and Gravel Base
					ML	FILL - CLAYEY SILT - some Sand, dark grey
	31.2	90	15	■		SURFACE OF NATURAL SOIL
					CL	SILTY CLAY - light brownish grey
	31.3	92	40	■		
5					SC	CLAYEY SAND - fine to medium, light brownish grey
	19.1	104	45	■		END OF BORING AT 6'

NOTE: Water not encountered. No caving.

JB 2661.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.6

BORING 7

DATE DRILLED: January 24, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
	24.1	66	25	■	ML	FILL - CLAYEY SILT - some Sand, dark grey to black
	32.3	79	30	■	CL	FILL - SANDY CLAY - some asphalt, dark brownish grey
5	22.6	97	30	■		SURFACE OF NATURAL SOIL
	24.0	94	34	■	SP	ASPHALTIC SAND - fine to medium, dark grey to black
10	6.3	115	70	■		END OF BORING AT 11'

NOTE: Slight water seepage encountered at depths of 1'and 2'. Water level measured at a depth of 6' after completion of drilling. No caving.

JB 2661.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD MS

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.7

BORING 8

DATE DRILLED: January 26, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
					CL	FILL - SILTY CLAY - some Sand, brown and dark grey
	26.9	88	12	■		Piece of concrete
	36.3	78	9	■		(ENCOUNTERED AN OBSTRUCTION AT A DEPTH OF 3'; MOVED BORING 1' TO THE WEST)
5						SURFACE OF NATURAL SOIL
	32.0	83	30	■	CL	SILTY CLAY - greyish brown
	33.2	71	50	■	SP	ASPHALTIC SAND - fine to medium, black
10	15.0	106	100	■		END OF BORING AT 11'

NOTE: Water level measured at a depth of 2' 5 minutes after completion of drilling. No caving.

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

JB 2661.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.8

JB 2661.40813.0001 DATE 2/3/1995 F.T. AR DR. O.E. JB CHKD

Note: The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 9

DATE DRILLED: January 27, 1995
EQUIPMENT USED: 6" - Diameter Hand Auger

DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOW COUNT* (blows/ft.)	SAMPLE TYPE		
	15.0	81	25	■	CL	FILL - SILTY CLAY and SANDY CLAY - some rootlets, dark brownish grey
	19.2	100	20	■		SURFACE OF NATURAL SOIL SANDY CLAY - light yellowish grey
5	38.8	85	30	■	CL	
	43.9	79	30	■		
10	45.0	70	60	■	ML	CLAYEY SILT - some asphalt, dark grey
						END OF BORING AT 11'

NOTE: Slight water seepage encountered at a depth of 2½'. No caving.

LOG OF BORING

LAW/CRANDALL, INC.

FIGURE A-1.9

BORING I

DATE DRILLED: December 14, 1981

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION: 170.0***

ELEVATION (ft)	DEPTH (ft)	VOLATILE LIQUIDS * (% of dry wt)	DRY DENSITY ** (lbs/cu ft)	% of ENERGY (% of ...)	SAMPLE		
						CL	4" Concrete Slab FILL - SANDY CLAY - streaks of asphalt, some gravel, black and grey Pieces of tile
		27.8	88	2	■		
165	5						
		28.0	88	1	■		
						ML	SANDY SILT - some Clay, dark greyish-brown
		28.0	93	<1	■		
160	10				∇		
						CL	SANDY CLAY - dark greyish-brown
		28.0	85	2	■		
155	15	26.3	95	2	■	CL	SILTY CLAY - grey and brown
							Streaks of asphalt
		16.3	102	6	■		Petroleum odor
						SP	SAND - IMPREGNATED WITH ASPHALT - fine, black
150	20						
		6.1	118	8	■		
145	25						
		6.6	114	13	■		
140	30						
		7.3	110	14	■		
135	35						Some gravel
		4.6	118	14	■		
130	40						

* Liquids that are evaporated at 105°C.

** Within the asphaltic soils, the dry densities include the weight of soil and non-volatile asphalt.

*** Elevations refer to datum of reference drawing; see Plate 1 for location and elevation of bench mark.

∇ Indicates surface of firm soils.

(CONTINUED ON FOLLOWING PLATE)

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB A-81396 DATE 12/18/81 DR JOHN C.E. MD W.P. fm CHKD

Form 123

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

BORING I (CONTINUED)

DATE DRILLED: December 14, 1981

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	VOLATILE LIQUIDS (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.	
		5.1	114	13	■	About 20% gravel
125	45	7.5	115	14	■	Less gravel
120	50					About 10% gravel
115	55	6.2	110	13	■	Coarse Sand, about 20% gravel
110	60	13.3	104	10	■	
						SILTSTONE - weathered, streaks of asphalt, dark greyish-brown
105	65	27.1	79	11	■	
100	70	26.0	87	11	■	
95	75	14.5	98	26	■	
90	80					

NOTE: Drilling mud used in drilling process. Mud removed to 25' at completion of drilling. Water level measured at about 6½' 3 days after completion of drilling.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB A-81396 DATE 12/18/81 DR JOHN I.E. MD W.P. fm CHKD

Form 124

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

BORING 3

DATE DRILLED December 15, 1981

EQUIPMENT USED 5"-Diameter Rotary Wash

ELEVATION 165.7

ELEVATION (ft)	DEPTH (ft)	VOLATILE LIQUIDS (% of dry wt.)	DRY DENSITY (lbs/cu ft)	DRIVE ENERGY (ft kips/ft)	SAMPLE LOC		
165						CL	FILL - SANDY CLAY - about 20% gravel, some cobbles, brown and grey
		11.4	115	5			Pieces of concrete and brick
160	5						
		33.3	86	<1		ML	CLAYEY SILT - some Sand, black
					▽		
155	10					CL	SILTY CLAY - streaks of asphalt, grey
		20.9	105	8		ML	SANDY SILT - some Clay, streaks of asphalt, dark brown
150	15	10.3	116	6		SP	SAND - IMPREGNATED WITH ASPHALT - fine, dark grey to black
							Some fines
145	20	8.6	125	14			
140	25	7.7	119	13			
135	30	5.4	118	19			Some gravel
	35	5.9	119	11			

NOTE: Drilling mud used in drilling process. Mud removed to 20' at completion of drilling. Water level measured at 6½' 2 days after completion of drilling.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES

Form 123 JOB A-81396 DATE 12/18/81 DR JOHN D.E. RID W.P. CHKD

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

PLATE A-1.3

BORING 4

DATE DRILLED: April 12, 1984

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 168.3***

ELEVATION (ft.)	DEPTH (ft.)	VOLATILE LIQUIDS (% of dry wt.) *	DRY DENSITY (lbs./cu.ft.) **	DRIVE ENERGY (ft.-kips/ft.) **	SAMPLE LOC.		
165		30.9	100	< 1	■	CL	FILL - SILTY CLAY - few gravel, roots, dark grey
	5						Exposed sewer pipe (moved boring 5' south)
		19.6	108	2	■	CL	SILTY CLAY (POSSIBLY FILL) - dark grey
160		16.8	99	10	■ ▽		
	10					ML	SANDY SILT - streaks of asphalt, dark grey
		19.1	103	3	■	CL	SILTY CLAY - streaks of asphalt, dark grey
155							
	15	17.2	99	7	■		Some fine Sand
150		7.0	116	11	■	SP	SAND - IMPREGNATED WITH ASPHALT - fine, black
	20	6.5	119	11	■		
145							
	25	7.3	116	14	■		
140							Some gravel
	30	6.5	124	19	■		
135							
	35	4.2	116	19	■		
130							
	40						

NOTE: Drilling mud used in drilling process. Mud removed at completion of drilling. Water level measured at 4' 12 days after removal of mud.

* Liquids that are evaporated at 105°C.

** Within the asphaltic soils, the dry densities include the weight of soil and non-volatile asphalt.

*** Elevations refer to datum of reference drawing; see Plate 1 for location and elevation of bench mark.

▽ Indicates surface of firm soils.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

Form 123 JOB A-81396-B DATE 4/18/84 DR. JOHN E. D. W.P. K CHKD TM

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

IMPORTANT INFORMATION

Important Information

About Your Geology and Soils Discipline Report

IMPORTANT INFORMATION

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining

IMPORTANT INFORMATION

your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

IMPORTANT INFORMATION

being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

APPENDIX F

Paleontological Resources Technical Report

Paleontological Resources Technical Report La Brea Tar Pits Master Plan, Los Angeles, California

JANUARY 2023

PREPARED FOR

Los Angeles County Museum of Natural History Foundation

LEAD AGENCY

County of Los Angeles

PREPARED BY

SWCA Environmental Consultants

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT
LA BREA TAR PITS MASTER PLAN
LOS ANGELES, CALIFORNIA

Prepared for:

Los Angeles County Museum of Natural History Foundation
On behalf of County of Los Angeles Museum of Natural History
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SWCA Project No. 63953

January 2023

EXECUTIVE SUMMARY

Purpose and Scope: The Los Angeles County Museum of Natural History Foundation (Foundation) retained SWCA Environmental Consultants (SWCA) to prepare a Paleontological Resources Technical Report in support of the proposed La Brea Tar Pits Master Plan (proposed project) in the City of Los Angeles, California. The La Brea Tar Pits, the George C. Page Museum (Page Museum), and associated facilities are owned by the County of Los Angeles (County) but are managed by the non-profit Foundation. The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the Natural History Museums of Los Angeles County, including the La Brea Tar Pits and Page Museum. The overall Master Plan consists of nine principal project components: 1) Page Museum renovations, 2) Wilshire Gateway entry plaza and Lake Pit, 3) enhanced Central Green, 4) revamped Pit 91, 5) new museum building, 6) new public promenade, 7) new pedestrian path, 8) 6th Street entry gateway, and 9) support building. SWCA has prepared this technical report to summarize the results of a paleontological existing conditions assessment that includes a review of asphalt pit and fossil locality data from multiple sources, published scientific literature, online fossil locality database results, previous paleontological resources assessments, and museum records search results from the County Museum of Natural History (Museum of Natural History); regional and local geologic maps; and subsurface geotechnical/borehole data. This technical report also includes an impacts assessment for the potential project and proposes avoidance and minimization measures to reduce potential impacts to less-than-significant levels, pursuant to the requirements of the California Environmental Quality Act (CEQA).

Date of Investigation: In summer 2022, SWCA reviewed scientific literature; online fossil locality databases; geologic and paleontological information from previous paleontological resources assessments and environmental documents; and fossil taxonomic data provided by the Page Museum. These data were supplemented by a museum records search from the Museum of Natural History that was received on February 5, 2022. SWCA also conducted site visits to verify the data with the Page Museum curators, collections managers, and preparators in September and October 2022.

Summary of Findings: The La Brea Tar Pits represents a world-renowned fossil site that has yielded millions of significant late Pleistocene to middle Holocene fossils, with recovered taxa characteristic of the "Rancholabrean" North American Land Mammal Age stage. A review of the existing conditions at the site indicates that the entirety of Hancock Park contains a veneer of artificial fill overlying older alluvium that is subsequently underlain by the San Pedro Sand and Fernando Formation at greater depths. Although considered scientifically less valuable or scientifically nonsignificant in most circumstances (Society of Vertebrate Paleontology 2010), fossils from artificial fill and reworked sediments originating from within Hancock Park may still provide scientifically important information due to the heightened paleontological importance and level of fossil preservation of this world-renown fossil site. Therefore, Recent artificial fill and reworked sediments originating from Hancock Park have a high potential to produce significant paleontological resources. Additionally, asphalt deposits seeping from the underlying geologic units to the surface through the artificial fill may contain fossils, albeit to lesser degrees than the underlying older alluvium. The thickness of fill and disturbed sediments likely varies across the site but may extend as deep as 8 feet below ground surface in some areas, or as shallow as 3 feet below ground surface in others. Generally, late Pleistocene older alluvium, early Pleistocene San Pedro Sand, and early Pleistocene to Pliocene Fernando Formation have high paleontological potential throughout their extents within the Los Angeles Basin. Crosscutting the site's stratigraphy, asphalt pools, seeps, and chimneys have yielded a substantial proportion of the fossils recovered from Hancock Park. Most asphalt or asphalt-saturated alluvial sediments that have yielded Rancholabrean fossils are from 13 to 20 feet below ground surface, but possibly range from near the surface to approximately 40 feet below ground surface. It is critical to recognize that the age of the fossils is related to when the asphalt reached the surface, not the age of the enclosing geological formation. This has proved a challenge to researchers as established principles of

superposition do not apply at Rancho La Brea. Therefore, significant paleontological resources may be impacted by construction or implementation of the project regardless of depth since ground-disturbing activities associated with the construction of the project have the potential to impact asphalt seeps containing aggregates of fossils.

Conclusions and Recommendations: Any fossils encountered during ground-disturbing activities could be at risk for damage or destruction from such activities, which could constitute a potentially significant impact under CEQA, depending on the nature of the fossil encountered. The implementation of appropriate feasible mitigation measures prior to and during ground-disturbing activities will ensure that fossils, if encountered, are assessed for significance and, if significant, salvaged to the extent feasible for laboratory analysis and (eventual) curation within the Page Museum (or their designee). These actions will reduce impacts to paleontological resources to less-than-significant levels, pursuant to CEQA.

Avoidance and minimization measures include: 1) retaining a Qualified Professional Paleontologist (Project Paleontologist) who meets the standards defined by the Society of Vertebrate Paleontology; and 2) development of a Paleontological Resources Management Plan (PRMP) that includes (but is not limited to) communication and coordination protocols, monitoring procedures, fossil salvage and processing procedures, and final reporting requirements. The PRMP shall require that full-time paleontological monitoring shall occur during all ground-disturbing activities (regardless of depth), including the inspection of artificial fill and reworked sediments to check for the presence of asphaltum and fossilized remains previously not collected. The Project Paleontologist may recommend changes in the implementation of the PRMP in consultation with the County of Los Angeles (County) and the Page Museum curators. Additionally, special considerations shall be given to the project design elements and geotechnical and soils remediation or hazard reduction recommendations, including but not limited to the paleontological screening of tar sands prior to disposal or treatment. Paleontological monitoring shall include inspection of exposed sedimentary units during active excavations, grading, tar sand removal, and any other ground-disturbing activity that has the potential to impact sediments capable of preserving significant fossils. The Page Museum curators (or their representatives) and the paleontological monitor shall have authority to temporarily divert activity away from exposed fossils to evaluate the significance of the find and, should the fossils be determined significant or likely significant, professionally and efficiently recover the fossil specimens and collect associated data. Data collection procedures may require the support of construction contractors to carefully and efficiently collect field data and extract the fossils to allow construction to continue. Grading and earthwork contractors shall follow the guidance of the Page Museum staff or Project Paleontologist regarding the collection and/or extraction of paleontological resources. The monitor shall record pertinent geologic data and collect appropriate sediment samples from any fossil localities. Recovered fossils shall be directly retained by the Page Museum for later analysis, laboratory preparation, and eventual curation if deemed significant or important.

Upon conclusion of ground-disturbing activities, the Project Paleontologist overseeing paleontological monitoring shall prepare a final monitoring report that documents the paleontological monitoring efforts for the project and describes any paleontological resources discoveries observed and/or recorded during the life of the project. The final monitoring report and any associated data pertinent to the salvaged fossil specimen(s) shall be submitted to the Page Museum and the County within 90 days after construction is completed.

Disposition of Data: This report will remain on file at the Page Museum, the County, and SWCA's Pasadena office.

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1 INTRODUCTION

1.1 Project Purpose and Scope

The 13-acre La Brea Tar Pits project site is located within the eastern and northwestern portions of the 23-acre Hancock Park (Assessor's Parcel Number [APN] 5508-016-902). The La Brea Tar Pits, the George C. Page Museum (Page Museum), and associated facilities, are owned by the County of Los Angeles but are managed by the non-profit Los Angeles County Museum of Natural History Foundation (Foundation). The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the County of Los Angeles Museum of Natural History (Museum of Natural History), including the La Brea Tar Pits and the Page Museum. The County of Los Angeles (County) is the Lead Agency under the California Environmental Quality Act (CEQA); the Museum of Natural History is a County departmental unit.

The Foundation retained SWCA Environmental Consultants (SWCA) to prepare a Paleontological Resources Technical Report in support of the proposed La Brea Tar Pits Master Plan (proposed project) in the City of Los Angeles, California. The Foundation proposes a redevelopment, or "reimagining," of the La Brea Tar Pits site, including the Page Museum and portions of the surrounding Hancock Park. The Foundation proposes a reimagined site design, expansion, and upgrades for the La Brea Tar Pits complex, including renovations to the Page Museum. The project site is located at 5801 Wilshire Boulevard in Los Angeles, California. Hancock Park was established on the site in the early twentieth century. The western boundary of the project site is approximately 0.05 miles to the eastern entrance of the Los Angeles County Museum of Art (LACMA).

The project site encompasses the La Brea Tar Pits, whose facilities include the 1977 Page Museum; 1952 Observation Pit; various excavation sites (including the Lake Pit) and features, primarily with temporary construction serving as support facilities; a concession and public restroom building; a multipurpose lawn and recreational areas; hardscaping/landscaping features throughout the park; and a surface parking lot.

This study was conducted to address potentially significant adverse direct and indirect impacts to paleontological resources to facilitate compliance with the CEQA, California Public Resources Code (PRC) 5097.5, and local regulations.

1.2 Key Personnel

The lead author and investigator for this study was Lead Paleontologist, Mathew Carson, M.S. Assistant Staff Paleontologist Kristina Akesson, B.S., contributed to researching and writing portions of the report. Principal Paleontologist, Russell Shapiro, Ph.D., provided oversight and quality assurance/quality control (QA/QC). Mr. Carson and Dr. Shapiro are Qualified Professional Paleontologists (Project Paleontologists) who meet or exceed the professional standards defined by the SVP (2010) (see Appendix A). Additional input was provided by SWCA Senior Archaeologist, Chris Millington, M.A., Registered Professional Archaeologist (RPA). John Dietler, Ph.D., RPA, served as the Principal-in-Charge of the project, and Bobbette Biddulph served as Project Manager. Figures were generated by SWCA Geographic Information System (GIS) Specialists Marty Kooistra, M.A., RPA, and Matthew DeFreese, M.A. Copies of the report are on file with the County, the Foundation, and SWCA's Pasadena office.

2 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The La Brea Tar Pits property (project site) is located at 5801 Wilshire Boulevard within the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902) (Figures 1 and 2). The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and is directly adjacent to the LACMA. The project site is located approximately 5.5 miles west from downtown Los Angeles and approximately 8.6 miles east of the Pacific Ocean. It is bounded by West 6th Street to the north (an approximately 1,200-foot-long frontage), South Curson Avenue to the east (an approximately 830-foot-long frontage), Wilshire Boulevard to the south (an approximately 500-foot-long frontage), and the LACMA to the west (an approximately 250-foot-long frontage). The area is known as the Miracle Mile neighborhood of the city of Los Angeles. This location is plotted in Sections 20 and 21, Township 1 South, Range 14 West, as depicted on the U.S. Geological Survey (USGS) Hollywood, California, 7.5-minute topographic quadrangle (Figure 1, Figure 2, and Figure 3).

2.2 Existing Conditions and Surrounding Land Uses

The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and broadly encompasses what is known as the La Brea Tar Pits, which includes the Page Museum (see Figure 2). The entirety of Hancock Park is enclosed within an 8- to 10-foot-high metal fence, which serves to secure the site by providing full closure of Hancock Park when the La Brea Tar Pits, Page Museum, and LACMA are closed in the evenings.

The Page Museum is approximately 63,200 square feet and is located on the eastern portion of the project site. The project site contains multiple active fossil quarries, commonly called "tar pits." The active tar pits (Pits 3, 4, 9, 13, 61, 67, and 91) are located within the northwestern portion of the project site, along with the Observation Pit on the western boundary of the project site. Project 23[1] and Pit 91 are active fossil recovery and excavation sites also located in the northwestern portion of the project site. The Lake Pit is a former commercial asphalt quarry and is the largest excavation on the grounds of Hancock Park; the Lake Pit is located in the southeastern portion of the project site.

The project site includes an approximately 28,000-square-foot multipurpose grass lawn, known as the Central Green, located to the west of the Page Museum. Parking for the La Brea Tar Pits is located in the northeast corner of the project site, at the corner of South Curson Avenue and West 6th Street (see Figure 2). Vehicles enter and depart the lot from both directions on South Curson Avenue.

The project site is surrounded by a variety of commercial uses, museums, residential buildings, and schools. The project site is bounded by the Park La Brea Pool and multi-family residential uses to the north across West 6th Street, commercial and residential uses to the east across South Curson Avenue, the Craft Contemporary Museum and other museum and commercial uses south across Wilshire Boulevard, and museum and commercial uses to the west.

[1] During construction on the LACMA parking garage in 2006, 16 new paleontological deposits were discovered, including an almost-complete skeleton of an adult mammoth. Given the size of the discoveries, 23 large wooden boxes were built around the various deposits, allowing many of the discoveries to remain intact. "Project 23" has now become the short-hand descriptor for the location and activities related to the excavation of deposits within the 23 large wooden boxes that is now occurring in a portion of the La Brea site.

Figure 1. Project site vicinity.

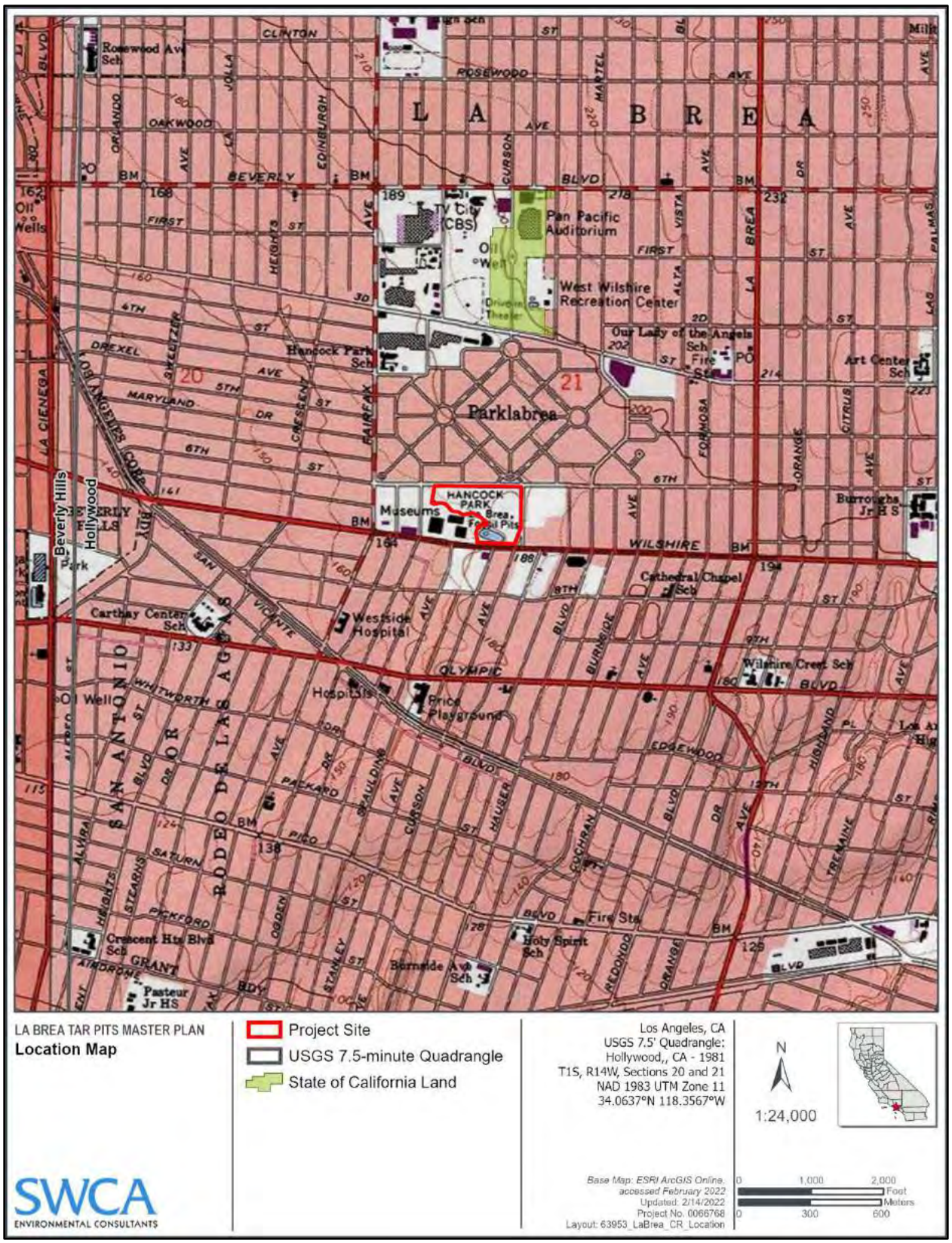

Figure 2. Project site plotted on the Hollywood, California, USGS 7.5-minute topographic quadrangle.

Figure 3. Project site shown on 2020 aerial photograph.

2.3 Proposed Project

The project would result in a reimagined site design, expansion, and upgrades for the La Brea Tar Pits complex and portions of Hancock Park, including renovations to the Page Museum (Figure 4). Table 1 provides a summary of the project components; more detail on the project components is provided following the table.

Table 1. Project Components Summary

Project Component	Description
Page Museum Renovations	Renovate existing building in same footprint (approximately 63,200 square feet). Demolish existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. Construct new 2,000-gross-square-foot (gsf) satellite maintenance and support building.
New Museum Building	Construct a new two-story 40,000-gsf museum building northwest of the Page Museum, including two new theaters.
Wilshire Gateway	Renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue with shaded canopy and new welcome pavilion.
The Lake Pit	Construct a pedestrian bridge and walking path over the Lake Pit. Install a new garden bioswale.
6th Street Gateway	Renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA service drive with shaded canopy and new welcome pavilion.
Tar Pits (Pits 3, 4, 9, 13, 61, 67, and 91; Project 23)	Renovate the existing facilities at all the tar pits in the northwestern portion of the project site.
Pedestrian Path and Recreation Areas	Reconfigure the existing pedestrian pathways on-site into a continuous 1-kilometer-long paved pedestrian path linking existing features on the project site. Improvements to the Central Green (establish a drivable path for food truck access). Establish a children's play area, picnic areas, and a small dog park west of the 6th Street Gateway.
Circulation and Parking	Expand existing parking lot from 63,000 square feet to 65,000 square feet and relocate approximately 50 to 70 feet to the north. This would require removal and relocation of existing trees on-site. Increase vehicle parking spaces approximately 5 to 15 spaces for a total of 160 to 170 vehicle parking spaces. Addition of new landscaping and vehicle access lanes to the parking lot. Establish new school drop-off/loading area approximately 215 to 230 feet long on South Curson Avenue adjacent to the Wilshire Gateway picnic area.
Landscaping Concept Plan	Establish three distinct landscaping zones encircled by looping pedestrian path. Creation of biofiltration areas for stormwater management. Introduction or relocation of approximately 84 trees from existing locations on-site to new locations on-site.

Figure 4. Conceptual site plan, La Brea Tar Pits Master Plan

2.3.1 Page Museum Renovations

The project would renovate the existing Page Museum within the same footprint as the existing building (currently approximately 63,200 square feet) to allow for enlarged exhibition space, additional storage, a ground floor café, and retail space. The central atrium would be renovated to provide additional exhibitions and provide additional classroom and laboratory space. The second floor of the Page Museum would contain two classrooms and a multipurpose space. An outdoor café and bar would be located next to these spaces on the center terrace on the west side of the Page Museum. A sloped green roof would be installed to the north of the Page Museum and would curve to the west. The project would add several sustainability features to the Page Museum. The features include enhanced daylighting, rainwater collection leading to bioswales, a sloped green roof, and rooftop solar photovoltaic panels.

In addition, the project would demolish the existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. A new 2,000-gross-square-foot (gsf) satellite maintenance and support building would be constructed for additional storage, administration, and research space directly west of the parking lot.

2.3.2 New Museum Building

A new two-story museum building would be located to the northwest of the Page Museum (see Figure 3 and Figure 4). The building would be approximately 40,000 gsf and would increase the total museum square footage to 104,000 gsf. The new museum building would include an extended central lobby, exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock.

The Page Museum and new museum building would be continuously connected on the first floor. The first-floor central lobby would face southwest toward the Central Green and branch off into the Page Museum to the east and the new museum building to the west. An updated retail and café space would be located off the lobby and look out over the Central Green. The Page Museum and the new museum buildings would be disconnected on the second floor, which would rise above the earthen berm. The separated facilities would be accessible through sloped outdoor walkways from the Central Green or interior staircases in the museum. There would be pedestrian entrances leading into the central lobby from the Central Green and from the parking lot. The existing Page Museum entrance would be converted to an educational group and tour entrance, which would be connected to a new school drop-off area on South Curson Avenue.

2.3.3 Entrance Renovation and Other Internal Circulation Improvements

The project would renovate the existing entrance to the La Brea Tar Pits located at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza; this would provide orientation, spaces for gathering and queuing, and restrooms (see Figure 3 and Figure 4). A picnic area would also be located under the shaded canopy.

A pedestrian bridge and walking path would be constructed over the Lake Pit. Directly to the east of the Lake Pit, a new garden bioswale would be installed to manage stormwater and would include vegetation related to the relocated mammoths and mastodon sculptures.

A school drop-off area on South Curson Avenue would lead directly to the education museum entrance, enabling the choreography of student tour itineraries that are distinct from general museum visitors and other tour groups.

The project would renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA parking garage. Similar to the Wilshire Gateway, a shaded canopy and welcome pavilion would provide orientation, legibility, and amenities. As a visible point of arrival from the residential communities to the north, this new entry would welcome visitors to a shaded park space where community park and recreational needs are balanced with the research activities of La Brea. Under the canopy of shade trees, visitors would find diverse destinations, including play areas, picnic areas, seating and interpretation zones at the protected tar seeps, the gentle topography and bioswales along Oil Creek, and the revitalized destinations of the Dorothy Brown Amphitheater, Observation Pit, and Pit 91. Along the south edge of the loop path, connections would allow access to other Hancock Park programs and transportation connections.

2.4 Ground Disturbances

At the time of preparation of this report, the proposed project is at the preliminary design stages, and final engineering, design, and grading plans for the project have not been finalized. Therefore, estimates of the depth of ground disturbances that were provided by the Foundation are discussed here. Due to anticipated soil conditions, on-site soils are not expected to be suitable for reuse and would need to be exported for remediation and disposal. As such, it is anticipated that project earthwork activities would include an estimated 53,000 cubic yards of cut/export and potentially 37,000 cubic yards of imported fill. While the exact depth of construction and the finish grade of the new museum building has not been established, this analysis assumes that the depth of excavation would be approximately 6 to 10 feet below ground surface. While the final elevation of the foundation for the new museum building is not known at this time, it may be below the existing ground surface in order to provide a smooth connection to the existing Page Museum.

3 REGULATORY SETTING

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under state and local laws and regulations.

3.1 State Regulations

3.1.1 California Environmental Quality Act

CEQA is the principal statute governing environmental review of projects occurring in the state and is codified at California PRC Section 21000 et seq. CEQA requires lead agencies to determine whether a proposed project would have a significant effect on the environment, including significant effects on paleontological resources. Guidelines for the Implementation of CEQA, as amended most recently on December 28, 2018 (Title 14, Chapter 3, California Code of Regulations 15000 et seq.), define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section VII(f) of the Environmental Checklist (State CEQA Guidelines: Appendix G) asks whether a project would directly or indirectly destroy a unique paleontological resource and result in impacts to the environment.

3.1.2 California Public Resources Code Section 5097.5

Requirements for paleontological resource management are included in PRC Division 5, Chapter 1.7, Section 5097.5, which states,

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

These statutes prohibit the removal, without permission, of any paleontological site or feature from land under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC Section 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC Section 5097.5 also establishes the removal of paleontological resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, and district) land.

3.2 County of Los Angeles

The Conservation and Natural Resources Element of the *Los Angeles County General Plan 2035* (General Plan) (County of Los Angeles 2015) recognizes paleontological resources in Section VIII: Historic, Cultural, and Paleontological Resources, and aims to promote public awareness of their value and foster their public enjoyment. Therefore, the General Plan contains one goal (C/NR 14) aimed at the protection of historic, cultural, and paleontological resources, with the following four policies pertinent to paleontological resources:

- **Policy C/NR 14.1:** Mitigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible.
- **Policy C/NR 14.2:** Support an inter-jurisdictional collaborative system that protects and enhances historic, cultural, and paleontological resources.
- **Policy C/NR 14.5:** Promote public awareness of historic, cultural, and paleontological resources.
- **Policy C/NR 14.6:** Ensure proper notification and recovery processes are carried out for development on or near historic, cultural, and paleontological resources.

3.3 City of Los Angeles

While the project site is located within the City of Los Angeles, it is owned by the County of Los Angeles and is proposed for uses that benefit the public. Accordingly, the project is not subject to the regulatory controls of the City of Los Angeles; however, the project will be in compliance with City of Los Angeles requirements. Planning documents of the City of Los Angeles that are most relevant to the project as they relate to paleontological resources are discussed herein for informational purposes.

Section 3 (Archaeological and Paleontological) of the *City of Los Angeles General Plan Conservation Element* (Conservation Element) recognizes paleontological resources (page II-3) and contains an objective (page II-5) to protect the city's archaeological and paleontological resources for historical, cultural, research, and/or educational purposes (City of Los Angeles 2001). The Conservation Element

includes the policy to "continue to identify and protect significant archaeological and paleontological sites and/or resources known to exist or that are identified during land development, demolition or property modification activities." The Conservation Element also states the following:

> Pursuant to CEQA, if a land development project is within a potentially significant paleontological area, the developer is required to contact a bona fide paleontologist to arrange for assessment of the potential impact and mitigation of potential disruption of or damage to the site. If significant paleontological resources are uncovered during project execution, authorities are to be notified and the designated paleontologist may order excavations stopped, within reasonable time limits, to enable assessment, removal or protection of the resources. (City of Los Angeles 2001:II-5)

Section D:1 of the *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) specifies that the determination of significance for paleontological resources shall be made on a case-by-case basis, taking into consideration the following factors:

- Whether, or the degree to which, the project might result in the permanent loss of, or loss of access to, a paleontological resource.
- Whether the paleontological resource is of regional or statewide significance.

4 DEFINITION OF SIGNIFICANCE

The Society of Vertebrate Paleontology (SVP) has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys; monitoring and mitigation; data and fossil recovery; sampling procedures; and specimen preparation, identification, analysis, and curation (SVP 1995, 2010). Most practicing professional mitigation paleontologists in California adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most state regulatory agencies with paleontological laws, ordinances, regulations, and standards accept and use the professional standards set forth by the SVP.

As defined by the SVP, significant paleontological resources are

> fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years). (SVP 2010:11)

Numerous paleontological studies have developed criteria for the assessment of significance for fossil discoveries (e.g., Eisentraut and Cooper 2002; Murphey et al. 2019; Scott and Springer 2003). In general, these studies assess fossils as significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living, or extinct.
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein.

3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas.
4. The fossils demonstrate unusual or spectacular circumstances in the history of life.
5. The fossils are in short supply and/or are in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation and are not found in other geographic locations.

5 PALEONTOLOGICAL POTENTIAL CLASSIFICATION

Geologic units known to preserve significant fossils or fossil localities are likely to contain additional undiscovered and potentially significant fossils throughout their areal and stratigraphic extent. Paleontological potential ("sensitivity") is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by the paleoenvironmental conditions or depositional setting of the geologic units, history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. The extent of sensitivity differs from that defined for archaeological resource sites as follows:

> It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontological sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontological potential in each case. (SVP 1995:23)

Many archaeological sites contain features visually detectable on the surface. In contrast, fossils may be present at the surface or at depth within sediments or bedrock. Subsurficial fossils would not be observable or detectable unless exposed by erosion or human activity. In the case of human activity, such as project-related ground disturbances within geologic units with a high probability to yield significant fossils, direct or indirect adverse impacts to significant fossils may occur.

In *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (SVP 2010:1–2), the SVP defines four categories of paleontological sensitivity for rock units with considerations for the potential of direct or indirect adverse impacts. These categories are: high, low, undetermined, and no potential.

> **High Potential.** Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ash or tephra), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstone, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstone, fine-grained marine sandstone, etc.). Paleontological potential consists of both a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with

animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

Low Potential. Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e.g., basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.

Undetermined Potential. Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

No Potential. Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection or impact mitigation measures relative to paleontological resources. (SVP 2010:1–2)

6 METHODS

The following sections present an overview of the methodology used to establish the existing paleontological conditions of the project site, analyze the potential for adverse impacts to significant paleontological resources due to implementation or construction of the proposed project, and determine avoidance and minimization measures to reduce adverse impacts to less-than-significant levels. The methodology used in this assessment conforms to industry standards as developed by the SVP (1995, 2010), as well as published best practices for mitigation paleontology (Murphey et al. 2019).

6.1 Existing Conditions Review

The La Brea Tar Pits has yielded the best preserved, most diverse, and most numerous fossils of the late Pleistocene and early to middle Holocene, providing paleontologists a unique opportunity to reconstruct the paleoecology of life as it existed in the Los Angeles region during that time (Stock and Harris 2007). Based on conditions listed in Section 4, Definition of Significance, and the paleontological potential classes described in Section 5, Paleontological Potential Classification, above, the geologic units within Hancock Park have an undeniably high paleontological sensitivity. In fact, the La Brea Tar Pits site has been selected as one of the first 100 Geological Heritage Sites by the International Union of Geological Sciences due to its local and global importance in understanding evolution, extinction, and climate change (personal communication from Dr. Lori Bettison-Varga [2022]). Nonetheless, questions persist regarding 1) the vertical and horizontal extent of fossiliferous deposits within the site; 2) the variation in quantities and irregular distribution of fossil material recovered from the different exploration pits across the site; 3) the historic exploration and salvage of fossils within the site and the influence such activities may have had on the current distribution of subsurface fossils in reworked sediments within Hancock Park; and 4) the ideal methodology to be used for data recovery and fossil salvage during preconstruction ground-

disturbing activities that minimizes the loss of scientifically important paleontological information. To establish the existing conditions within the site to the extent feasible, SWCA conducted an analysis of available existing data pertinent to paleontological resources within Hancock Park. This analysis included a review of asphalt pit and fossil locality data from multiple sources including published scientific literature; online fossil locality database results; previous paleontological resources assessments; museum records search results from the Museum of Natural History; regional and local geologic maps; and subsurface geotechnical/borehole data.

In summer 2022, SWCA reviewed scientific literature, online fossil locality databases, geologic and paleontological information from previous paleontological resources assessments and environmental documents, and fossil taxonomic data provided by the Page Museum. These data were supplemented by a museum records search from the Museum of Natural History that was received on February 5, 2022. Appendix B (confidential) provides a copy of the museum records search results. For a review of geologic mapping within and around Hancock Park, SWCA reviewed geologic maps prepared by Dibblee and Ehrenspeck (1991) at a scale of 1:24,000, Yerkes and Graham (1997) at a scale of 1:24,000, and Campbell et al. (2014) at a scale of 1:100,000. Being the most recently published map at the highest resolution, SWCA uses geologic mapping by Yerkes and Graham (1997) as the base for this investigation, with special considerations from Dibblee and Ehrenspeck (1991) and Campbell et al. (2014), following published best practices (Murphey et al. 2019). At the time of preparation of this report, a preliminary geotechnical investigation for the proposed project within Hancock Park was completed; however, further geotechnical work is needed following refinement of the project design. To supplement SWCA's synthesis of existing data relevant to the project site, Mr. Carson and Dr. Shapiro verified these data sources with the Page Museum curators, collections managers, and preparators during site visits in September and October of 2022. A summary of the existing conditions is presented in Section 7, Paleontological Resources Results.

6.2 Potential Impacts Review

CEQA requires that significant adverse impacts to paleontological resources be reduced to less-than-significant levels to the extent feasible. To determine if a project could result in direct or indirect impacts, published best practices in mitigation paleontology (Murphey et al. 2019; SVP 2010) recommend that the extent and depth of ground-disturbing activities that have the potential to impact previously undisturbed sediments of high paleontological sensitivity should be considered when assessing potential impacts. At the time of this paleontological resources study, the project is still in the conceptual stages, and the full extent and depth of ground-disturbing activities is unknown. Nonetheless, the potential for direct or indirect impacts can be assessed based on review of the existing conditions described above. After reviewing the existing data, SWCA analyzed the potential for direct and indirect impacts to significant paleontological resources due to construction or implementation of the project. A summary of the potential impacts is presented in Section 8 below.

6.3 Avoidance and Minimization Measures Determination

Based on review of the existing conditions and determination of the potential impacts, SWCA developed appropriate avoidance and minimization measures to reduce significant adverse impacts to less-than-significant levels, pursuant to the CEQA. To develop appropriate measures that would not preclude or drastically delay construction of the project while still protecting the scientific integrity of this world-renowned fossil site, SWCA reviewed previous paleontological resources assessments, CEQA environmental documents, paleontological mitigation plans, and final paleontological monitoring reports prepared by other environmental consultants for projects located within or adjacent to Hancock Park, many of which were for private development projects; published standard field and laboratory procedures

prepared by the Page Museum staff; and information from the Page Museum staff obtained by SWCA's Lead Paleontologist during two site visits in September 2022, and one site visit by SWCA Principal Paleontologist in October 2022. The information in these references, coupled with additional information from the Page Museum staff, were synthesized to develop avoidance and minimization measures that, when implemented under the direct supervision of the Page Museum, would reduce potential impacts to less-than-significant levels.

7 PALEONTOLOGICAL RESOURCES RESULTS

7.1 Regional Geology

The geological conditions that have made the La Brea Tar Pits the most renowned paleontological locality in the world are closely tied to the origin and development of petroleum reservoirs within the Los Angeles Basin, a structural depression approximately 50 miles long and 20 miles wide in the northernmost Peninsular Ranges Geomorphic Province (Ingersoll and Rumelhart 1999; Norris and Webb 1990; Yerkes et al. 1965). Although referred to as the "La Brea Tar Pits" today, the terms "brea" are "tar" are misnomers—the sticky, organic substance that is present at the surface is more correctly referred to as asphaltum (asphalt) or bitumen derived from naturally occurring petroleum. Within the La Brea Tar Pits and its vicinity within the Los Angele Basin, alluvial sediments are often saturated with the asphalt that seeps up to the surface from the underlying reservoirs. Asphalt from Rancho La Brea has been widely used by humans during prehistoric and historic periods, resulting in the discovery of the large quantities of significant fossil material during its extraction (see Millington et al. 2022).

Beginning in the Miocene when tectonic movement along the San Andreas Fault zone caused the rotation and northern migration of the Transverse Ranges from the Peninsular Ranges, the Los Angeles Basin originated as a subsided structural block located between these two providences (Critelli et al. 1995; Norris and Webb 1990). By the middle Miocene, tectonic subsidence resulted in the advancement of the sea across the primordial Los Angeles Basin, resulting in the deposition of thick, organic-rich, deep submarine basin sediments along the sea floor. Organic-rich sediments consisted of the deposition of dead microorganisms, such as diatoms, algae, and bacteria that settled to the seafloor, as well as organic-rich clays washed in from the Peninsular Ranges and Transverse Ranges. After subsequent burial and lithification, these organic-rich marine strata formed substantial petroleum reservoirs, some of which are the most prolific sources of oil in Southern California (Norris and Webb 1990; Yerkes et al. 1965).

The deposition of thick, organic-rich marine strata persisted through the Pliocene, a time when the rate of subsidence accelerated within the central region of the Los Angeles Basin where the La Brea Tar Pits are located today; this subsidence coincided with marked uplift of the surrounding mountain ranges along the basin's margins that continued contributing to the thick accumulations of organic-rich marine deposits within the basin (Norris and Webb 1990).

By the end of the Pliocene, more than 3,000 meters (10,000 feet) of mostly marine sedimentary deposits had filled the basin (Norris and Webb 1990). The latest Pliocene and early to middle Pleistocene were marked by tectonic movement of ancillary faults branching from the San Andreas Fault Zone. Tectonic movement during the latest Pliocene and early to middle Pleistocene deformed the older marine strata, facilitating the movement of gas and oil in the Los Angeles Basin to the surface via fractures and seeps, forming asphalt pools at the surface (Stock and Harris 2007). For example, local fissures, pipes, and chimneys allow petroleum from the underlying Miocene to Pliocene marine strata extracted below the surface within the Salt Lake Oil Field located immediately north of Hancock Park to seep to the surface as asphalt within Hancock Park (Stock and Harris 2007). The continuous recharge of asphalt seeped to the surface from the underlying Miocene and Pliocene marine petroleum reservoirs, plus the influx of

terrestrial alluvial sediments deposited at the surface, resulted in one of the best depositional environments for preserving fossils.

During the late Pleistocene and early to middle Holocene, changes in global sea level, tectonic subsidence, and rates of sedimentation resulted in the deposition of thick accumulations of nonmarine, alluvial deposits within the Los Angeles Basin (Norris and Webb 1990; Yerkes et al. 1965). The formation of asphalt pools at the surface, drawn up to the surface from the underlying marine Miocene and Pliocene strata via structural fractures, continues today within Hancock Park, though likely to a much lesser degree since the middle Holocene.

7.2 Local Geology and Paleontology

Because of its importance in petroleum exploration and the public and scientific interest in its paleontological setting, the La Brea Tar Pits has been the subject of intense study for the past 100 years. This section provides a summary of the local existing conditions at La Brea Tar Pits, including an overview of the history of paleontological discovery and exploration, as well as an overview of more recent local geological mapping and geotechnical investigations within Hancock Park and its immediate vicinity.

7.2.1 Paleontology of the La Brea Tar Pits

The paleoecological and paleoenvironmental conditions and unique geologic setting during the late Pleistocene and Holocene within Rancho La Brea have contributed to the high level of fossil preservation at the La Brea Tar Pits. In places where petroleum reached the surface, sticky pools of asphalt were left behind as the lighter petroleum products evaporated (Akersten et al. 1983). These pools of asphalt would then trap most organisms that passed through, most notably large predators, such as saber-toothed cats, dire wolves, and other extinct carnivores. This mechanism is reflected in the composition of mammals and birds discovered at the La Brea Tar Pits, which are 90% carnivores that likely had been attracted to the site to prey on those individuals already mired in the asphalt, but ultimately became mired themselves (Friscia et al. 2008). Bones could also be transported and entrapped in the asphaltic sediments through normal fluvial processes (Spencer et al. 2003); however, the extent that fluvial systems flowing across the asphaltic pools at the surface affected the preservation of paleontological resources in the vicinity of Hancock Park remains largely unexplored. Regardless, the asphalt that saturates the bones and other hard tissues of animals contributes to their excellent preservation.

With more than 100 excavation sites/pits resulting in over 3 million specimens representing over 600 species having been collected since the first scientific explorations (Figure 5), late Pleistocene and Holocene fossil taxa recovered, described, and curated include: diatoms, green algae, flowering plants and gymnosperms, scorpions, spiders, ostracods, isopods, millipedes, centipedes, insects, bivalves, gastropods, bony fish, salamanders, frogs, toads, pond turtles, lizards, iguanas, snakes, grebes, cormorant, herons, spoonbills, ibis, waterfowl, storks, teratornithids, vultures, hawks, eagles, falcons, landfowl, cranes, shorebirds, pigeons, roadrunners, owls, nightjars, woodpeckers, perching birds, shrews, moles, bats, ground sloths, rabbits, hares, rodents, weasels, badgers, skunks, coyotes, domesticated dogs, wolves, dire wolves, foxes, racoons, ringtails, short-faced bears, black bears, grizzly bears, saber-toothed cats, scimitar-toothed cats, American lions, cougars, bobcats, mastodons, mammoths, horses, tapirs, camels, llamas, peccaries, deer, antelopes, bison, shrub-ox, sheep, and others, as well as the human remains of one individual (i.e., the La Brea Woman) recovered from Pit 10 in 1914 (see Figure 5) (ArchaeoPaleo Resource Management, Inc. 2014; Museum of Natural History 2022; Pham 2015; Stock and Harris 2007).

Prior to the advent of modern radiometric dating methods, the geologic age of the fossil-bearing deposits at Rancho La Brea was determined by biochronologic correlations, comparing the fossil taxa excavated

from Rancho La Brea (see above) to taxa recovered from other fossil sites in North America (Stock and Harris 2007). Based on these comparisons, Stock and Harris determined that the Rancho La Brea deposits likely date to the late Pleistocene (Stock and Harris 2007). In fact, the "Rancholabrean" North American Land Mammal Age (NALMA) stage, characterized by the presence of the genus *Bison* and other extinct megafauna (e.g., genus *Mammuthus*), is named after the fossils recovered from Rancho La Brea that represent the latest Pleistocene Epoch (Savage 1951). Since Stock and Harris's work, modern radiometric dating confirmed the results of relative dating, with the oldest specimens recovered from Rancho La Brea being at least 55,000 years old (latest Pleistocene) and the youngest at least 200 years old (latest Holocene, which extends after the Rancholabrean NALMA stage) (Mychajliw et al. 2020; Bischoff and Rosenbauer 1981; Ho et al. 1969; Holden et al. 2017; Marcus and Berger 1984; McMenamin et al. 1982). It is critical to recognize that the age of the fossils is related to when the asphalt reached the surface, not the age of the enclosing geological formation. This has proved a challenge to researchers as established principles of superposition do not apply at Rancho La Brea. Therefore, the geological context of the discovery is most critical to retain scientific value.

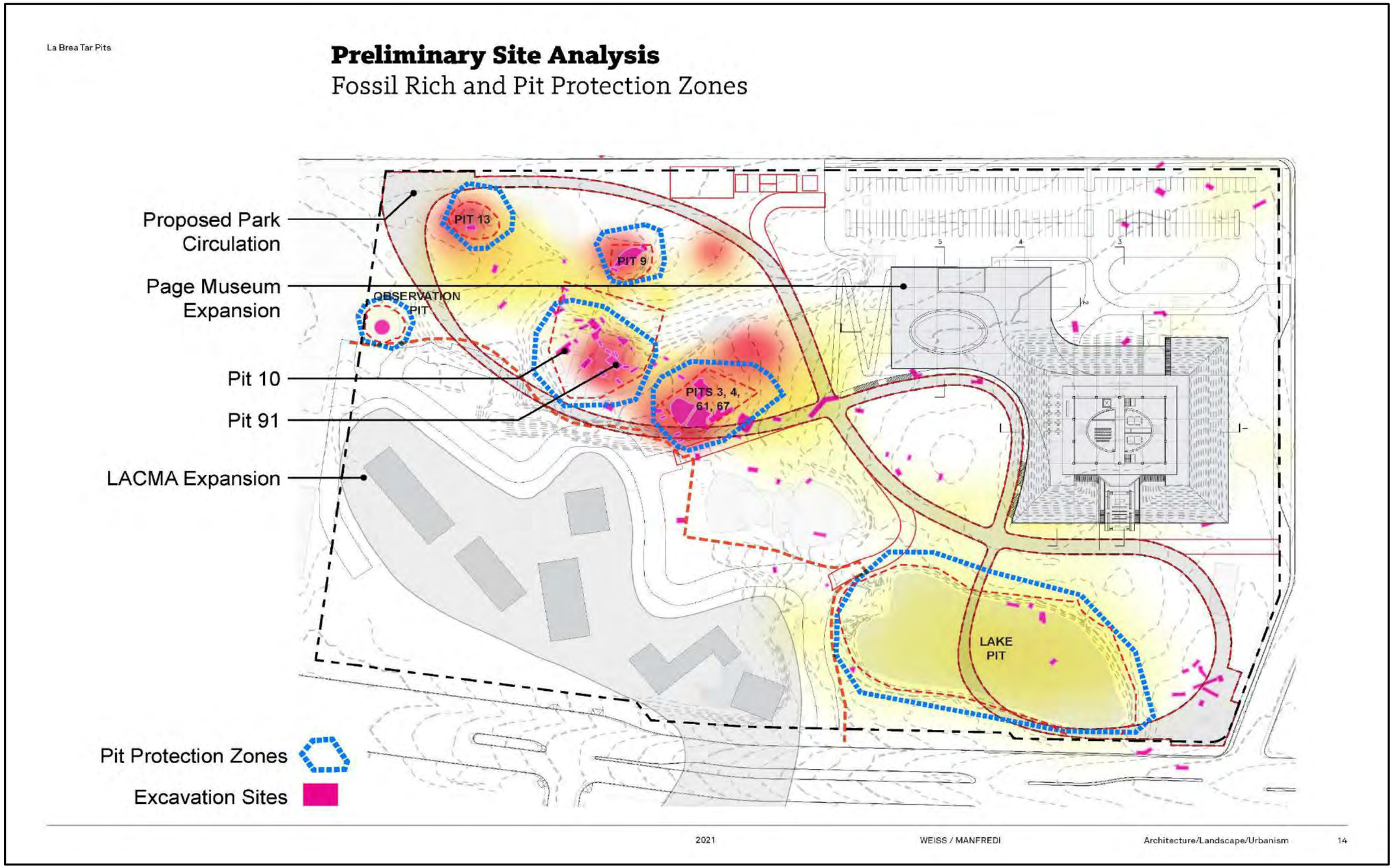

Figure 5. Conceptual site plan with excavation/pit sites and fossil heat map.

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7.2.2 Previous Excavations at La Brea Tar Pits

Records of bones being discovered at Rancho La Brea date to the 1800s; however, these bones were widely regarded as modern domesticated and wild animals that had fallen into the asphalt "traps" (Seaman 1914), and it was not until 1875 that the first extinct organism, a *Smilodon* (saber-toothed cat), was reported (Denton 1875). The first scientific excavations at La Brea Tar Pits site began much later when Orcutt assessed the feasibility of the site for oil extraction in 1901 and discovered more fossils of extinct taxa (Stock and Harris 2007). By 1906, Orcutt had amassed a collection of fossil material and gave it to Dr. John C. Merriam of the University of California, who requested permission from the Hancock family to conduct paleontological investigations. By 1913, the Hancock family granted the County exclusive privilege to excavate the site for 2 years, during which hundreds of thousands of bones were discovered among the various exploration pits (see Figure 5) (Stock and Harris 2007). By May 1915, the Hancock family donated approximately 23 acres of Rancho La Brea to the County; this land ultimately became Hancock Park. Today, excavations continue under the direction of the Page Museum, which houses this world-renowned collection.

After the initial excavations that occurred between 1913 and 1915, little in the way of formal excavation was accomplished until 1969. Intermittent small-scale excavations occurred between 1929 and 1931. In 1969 excavations resumed in one of the exploration pits, dubbed Pit 91, with excavations continuing to the present (Friscia et al. 2008; see Figure 5). Since the reopening of Pit 91, 320 species have been recovered. During the 20072007 field season alone, 3,300 specimens were recovered, including the skulls of saber-toothed cats and dire wolves, ground sloth bones, and the first confirmed juvenile mammoth. As of the 20072007 field season, Pit 91 had been excavated to a depth of 15 feet, with an estimated 3 to 8 feet of asphaltic deposits remaining further below ground. Over the years, excavations at Pit 91 have resulted in the discovery of more than 50,000 fossils (with many more waiting to be prepared and curated in the laboratory at the Page Museum). A few other asphalt pits, such as Pit 3 and Pit 4, have resulted in the discovery of similarly impressive quantities of fossil specimens, but the quantities of fossil specimens recovered from the asphalt pits has varied widely, even among co-located pits or exploration sites (Figure 6). Although the quantities of fossil specimens recovered from asphalt pits are uneven, the distribution of the asphalt pools is not completely random and may be related to the orientation of subsurface faults or fissures that facilitate the movement of petroleum to the surface (see Figure 6). Additionally, the degassing of hydrocarbons during the conversion of petroleum to asphalt, evidenced by surface bubbles within the asphalt pools observed today, may have circulated and redistributed bones and other organic remains within the asphalt chimneys and seeps (Stock and Harris 2007), also potentially affecting the apparent distribution and quantity of fossil specimen.

Several recent construction projects within or immediately adjacent to Hancock Park have yielded numerous significant paleontological resources from the same deposits as those that would be encountered during implementation of the proposed project. ArchaeoPaleo Resource Management, Inc. (2014) provided a thorough review of paleontological resource assessment reports and mitigation monitoring reports from nearby development projects. A detailed description of each project included in their 2014 review is not included in this report; however, the results are summarized in Table 2. Recent projects from within or immediately adjacent to Hancock Park include the LACMA Transportation Project, the Academy Museum of Motion Pictures Project, the New LACMA Building for the Permanent Collection Project, and the One Museum Square Project. From the LACMA Transportation Project, numerous paleontological resources were discovered during monitoring of ground disturbances. In fact, 16 deposits of asphalt (or asphalt-rich sediments) containing abundant fossilized remains were extracted in 23 "landscaping/tree box" crates, as well as several isolated macrofossils (for example, one isolate yielded a nearly complete adult Columbian mammoth nicknamed "Zed") and 327 buckets of matrix containing microfossils.

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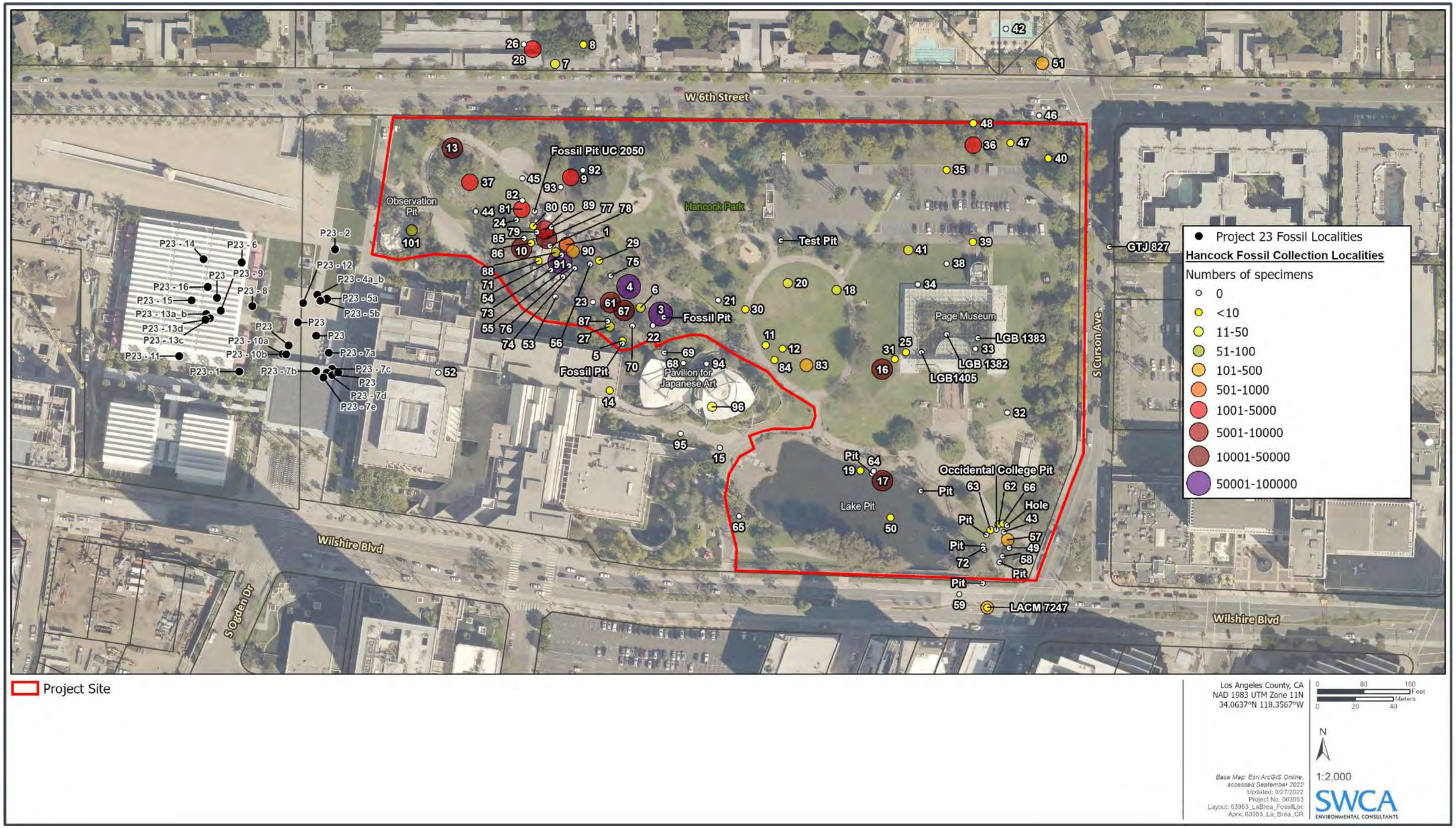

Figure 6. Quantity of fossil specimens recovered from each pit/site; quantities from Project 23 are not provided. Data received from Page Museum staff in 2022.

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The crated deposits are still being processed on the grounds of La Brea Tar Pits (referred to as "Project 23" by the Page Museum), with estimates of the number of fossils contained within ranging from 1 million to 3 million (ArchaeoPaleo Resource Management, Inc. 2014) (see Figure 6). Similar discoveries have been made during ground-disturbing activities at the Academy Museum of Motion Pictures and the New LACMA Building projects, each of which uncovered numerous significant fossil discoveries that were crated in a similar fashion, with each crate possibly containing hundreds to thousands of fossils remaining to be processed.

Table 2. Sample of Completed Local Paleontological Resources Monitoring Projects

Project Name	Year	Distance/Direction from Proposed Project	Monitoring Results
The Grove at Farmers Market	2001	1,000 meters (0.62 mile) north	Pleistocene gopher and plants; blue-green sandy silt
Farmers Market Renovation (also known as The Grove at Farmers Market Phases 2 and 3)	2001–2004	1,000 meters (0.62 mile) north	Pleistocene macrofauna, such as mammoth, horse, and indeterminant mammal; microfauna and flora; streambed soils, some asphalt deposit stringers
Park La Brea Community Center	2004	650 meters (0.40 mile) northeast	No fossils, caliche soils
Palazzo West/Palazzo at Park La Brea	1999–2003	700 meters (0.43 mile) north	Pleistocene macrofauna, such as horse, mammoth, bison, sloth; other vertebrates, such as frog, bird, rabbit, snake, skunk, various rodents; microfauna, such as clam, gastropod; plants; streambed sandstone, siltstone, claystone, some asphaltic deposit stringers
Palazzo East/Palazzo at Park La Brea	1999–2003	1,100 meters (0.68 mile) northeast	Pleistocene macrofauna, such as horse, sloth, camel, bison, and proboscidean/elephant; microfauna, such as ostracod; plants; fluvial alluvium composed of sandstone, siltstone, and claystone
The Villas at Park La Brea	1999–2003	1,100 meters (0.68 mile) east-northeast	No fossils observed; silty clay, caliche
Median Improvements, Wilshire Boulevard from Fairfax Avenue to La Brea Avenue	1996	80 meters (263 feet) south	No fossils observed; deposits too young to contain fossils
Hancock Park Renovation	1989–2003	Adjacent, east and north	Pleistocene macrofauna, such as mammoths; microfauna and flora; streambed soils and asphaltic deposits
Hancock Park Replacement Pipeline Discharge System	2012	245 meters (0.15 mile) east	Indeterminant mammal, large bird, small bird, microfossils; asphaltic deposits
Luxe@375 (apartment construction with subterranean parking)	2012	2,200 meters (1.37 miles) northwest	Pleistocene indeterminant bony fish, toad, frog, pond turtle, rattlesnake, indeterminant reptile, indeterminant bird, various rodents, camel, horse, rabbit, mastodon, ground sloth, bivalve, gastropod, plant (i.e., charcoal)
LACMA Transformation Project	2006–2008	Adjacent, west	"Project 23" – during construction, 16 asphaltic deposits, recovered in 23 trapezoidal/prismatic "tree boxes" holding 383 cubic meters of material contain an array of Pleistocene fossils, including terrestrial macrofauna, such as bison, dire wolf, mammoth, sloth, lynx, saber-toothed cat, horse, bird, turtle; microfossils; and plants resulting in thousands of fossil specimens. Additionally, individual or isolated specimens were jacketed or collected, including a Columbian mammoth.
Academy Museum of Motion Pictures	2019–2020	Adjacent, west	Numerous macrofauna, including saber-toothed cat, dire wolf, bison, ground sloth; and microfauna; plants; fluvial deposits with some asphaltic deposits

Project Name	Year	Distance/Direction from Proposed Project	Monitoring Results
New LACMA Building Project	2016–2017	Adjacent, west and southwest	Gastropods and bivalves from depths of 41 to 65 feet below ground surface; fine-grained sand and silty clay, saturated with asphalt
One Museum Square Project	2018–2019	Adjacent, east	Approximately 20,000 fossil specimens of birds and small mammals

Sources: AECOM (2016a, 2017); ArchaeoPaleo Resource Management, Inc. (2014); Environmental Science Associates (ESA) 2020

7.2.3 Museum Records Search

Since its construction in the 1970s, the Page Museum, included in the Museum of Natural History, has curated most of the fossil specimens excavated from the La Brea Tar Pits. Therefore, SWCA requested a museum records search from the Museum of Natural History to provide additional information pertaining to the paleontological resource potential at the surface and at depth within Hancock Park and its immediate vicinity.

Fossil localities within the project site include fossil locality LACM VP 7298 that produced approximately 10,000 plant, invertebrate, and vertebrate specimens. Additional vertebrate, invertebrate, and plant fossils have been discovered at locality LACM VP 6909 at the surface down to 20 feet below ground surface (bgs) within the project site. Numerous other fossil localities, including Project 23 described above, have been discovered and curated from within the project site.

Outside of the project site, the closest fossil locality is LACM VP 7297, which is located 16 meters (53 feet) southwest of the project site and has yielded approximately 250,000 vertebrate, invertebrate, and botanical specimens from asphaltic sand and clay. Fossil locality LACM VP 7247 was recorded 32 meters (106 feet) away from the project site and yielded an extinct dire wolf and horse from a depth of approximately 2 feet bgs. The presence of Pleistocene fossil taxa at 2 feet bgs suggests that fossils could be present just below the surface throughout most of Hancock Park. Additionally, an antelope fossil was discovered 113 meters (370 feet) from the project site within Pleistocene asphaltic older alluvium at locality LACM VP 4204. Other fossil localities approximately 322 meters (0.2 mile) or less from the project site, such as LACM VP 6345, LACM VP 5481, and LACM VP 1724, have yielded Pleistocene taxa “typical” of asphaltic alluvial sand deposits within the La Brea Tar Pits, including fossil turtle, bird, racoon, saber-toothed cat, dire wolf, coyote, mammoth, horse, tapir, camel, antelope, and bison.

Although not included in the museum records search results by the Museum of Natural History (2022), fossil locality LACM VP 8090, recorded during construction of the One Museum Square Project located approximately 100 meters (330 feet) away from the Page Museum on the eastside of Curson Ave yielded approximately 20,000 small mammal and bird fossils that are currently being processed at the Page Museum today (personal communication from Dr. Regan Dunn [2022]).

Table 3 summarizes the results of the Museum of Natural History (2022) museum records search. Appendix B (confidential) provides the results of the museum records search.

Table 3. Museum of Natural History Fossil Localities within and near the Project Site

Locality Number	Approximate Distance from the Project Site	Formation	Taxa	Approximate Depth Below the Ground Surface
LACM VP 7298	Within Hancock Park	Variably asphaltic silts and silty clays	Approximately 10,000 botanical, invertebrate, and vertebrate specimens	Unrecorded (approximately 25 feet below ground surface based on elevation of Hancock Park)
LACM VP 6909	Within Hancock Park	Asphaltic sands	Vertebrate, invertebrate, and plant fossils	0–20 feet
Project 23 (16 separate fossil deposits)	Within Hancock Park	Pleistocene fluvial deposits and asphaltic sands	Over 1 million fossil specimens including one nearly complete mammoth	Starting at 10 feet
LACM VP 7297	0.01 mile (53 feet/ 16 meters)	Asphaltic sand grading to asphaltic clay	Approximately 250,000 botanical, invertebrate, and vertebrate specimens	Unrecorded (approximately 2 feet to 10 feet below ground surface based on elevation of Hancock Park)
LACM VP 7247	0.02 mile (106 feet/ 32 meters)	Asphalt impregnated silt with lenses of asphaltic sand	Dire wolf (*Canis dirus*); horse (*Equus*)	2 feet
LACM VP 4204	0.07 mile (370 feet/ 113 meters)	Pleistocene asphaltic older alluvium	Antelope (*Antilocapra*)	Unrecorded
LACM VP 6345	0.10 mile (528 feet/ 161 meters)	Asphaltic sands	Bird (Aves); horse (*Equus* cf. *E. occidentalis*)	Unrecorded
LACM VP 5481	0.13 mile (686 feet/ 209 meters)	Asphalt-impregnated Palos Verdes Sand	Mammoth (*Mammuthus*); tapir (*Tapirus*); horse (*Equus*); camelid (*Camelops*, cf. *Hemiauchenia*); bison (*Bison*)	27–28 feet
LACM VP 1724	0.20 mile (1,056 feet/ 322 meters)	Pleistocene asphaltic sands	Pond turtle (*Clemmys marmorata*); bird (Aves); racoon (Procyonidae); sabretooth cat (*Smilodon fatalis*); dire wolf (*Canis dirus*), coyote (*Canis latrans*), pronghorn antelope (*Capromeryx minor*); bison (*Bison*)	8 feet

Source: Museum of Natural History (2022)

7.2.4 Geologic Mapping and Geotechnical Investigations

Local geologic mapping and previous geotechnical investigations of Hancock Park and the surrounding area provide the geological framework that informs the paleontological setting of this world-renowned fossil site; although as noted previously, the fossil deposits follow asphalt pits and are not confined to one particular geologic unit. Geologic mapping by Dibblee and Ehrenspeck (1991) and Yerkes and Graham (1997) indicate that the surface of the project site is mapped as late Pleistocene older alluvium (Qao) (for the purposes of this study, SWCA uses Yerkes and Graham [1997] as the basis for the geologic map shown in **Error! Reference source not found.**). Previous geotechnical investigations of the site summarized by Shannon and Wilson, Inc. (2022) indicate that the surface of the project site is capped by a thin layer of artificial fill that overlies the "native" older alluvium. The presence of artificial fill and/or previously disturbed sediments is evident along the 15-foot-high soil slopes surrounding the base of the

Page Museum but extends across the site in the subsurface. Additionally, regional and local subsurface geological data suggest that the

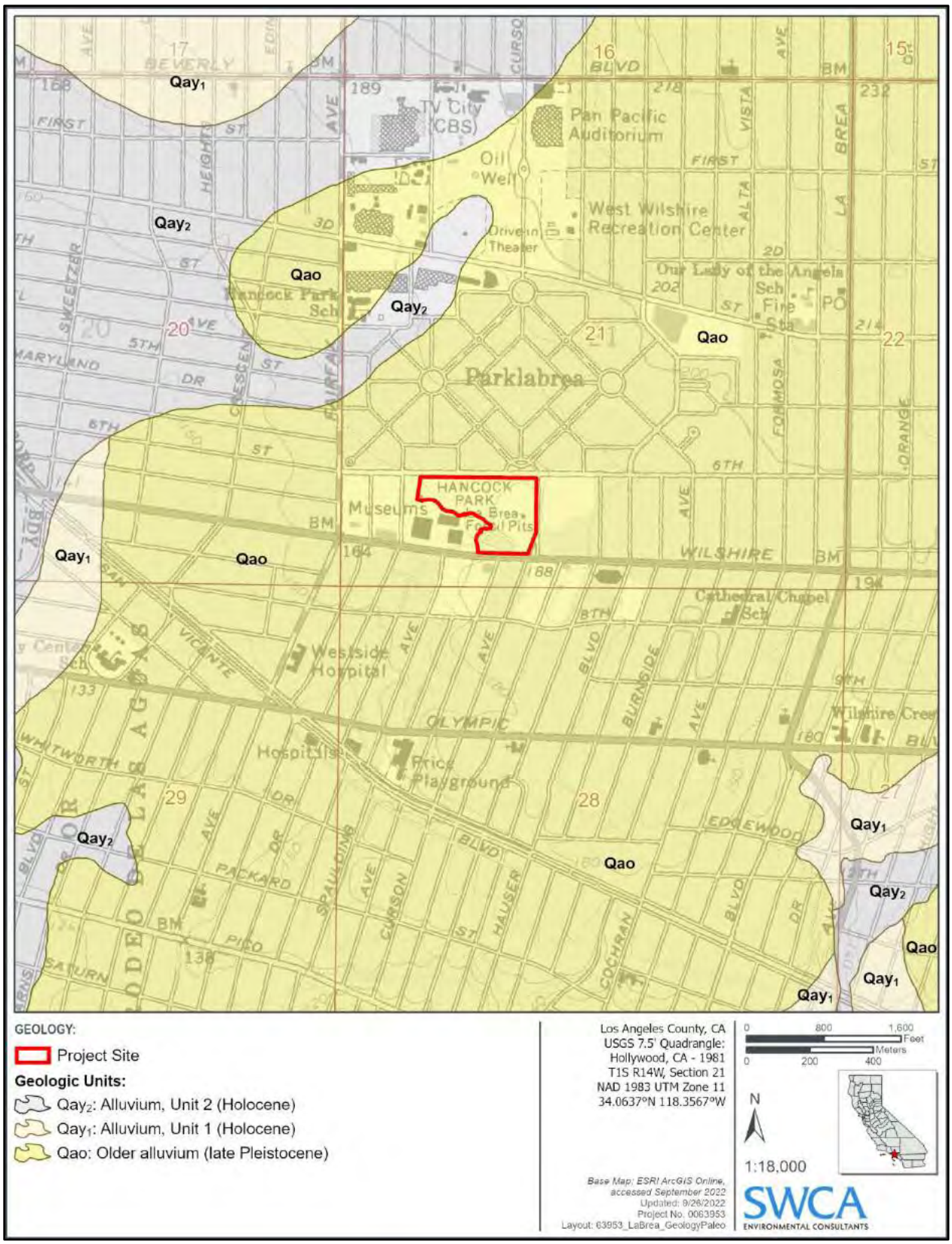

Figure 7. Surficial geologic units within the project site and its vicinity.

early Pleistocene San Pedro Sand and the early Pleistocene to Pliocene Fernando Formation are also present at depth within Hancock Park, despite not being exposed at the surface in the immediately vicinity. Therefore, artificial fill, older alluvium, San Pedro Sand, and Fernando Formation are considered in this analysis and are described in geochronological order (youngest to oldest) below.

7.2.4.1 UNMAPPED RECENT ARTIFICIAL FILL AND REWORKED SEDIMENTS

Based on previous site development, unmapped Recent artificial fill and reworked (i.e., previously disturbed) sediments are present at the surface of the project site from 1- to 3-foot depth or 1- to 8-foot depth, likely partially replacing the uppermost "native" sediments of older alluvium (AECOM 2017; Shannon and Wilson, Inc. 2014, 2022). The presence of artificial fill and reworked sediments across the entirety of the site to varying depths was confirmed during the archaeological testing conducted by SWCA within Hancock Park (Millington et al. 2022).

The artificial fill material consists of silty clay, sandy clay, clayey silt, and silty sand (Shannon and Wilson, Inc. 2022). In general, fill sediments typically consist of reworked and recompacted sediments originating from within a project site during its construction, or they consist of imported sediments delivered from other regions that are delivered and recompacted at a project site. Artificial fill or previously disturbed sediments may contain fossils, but any such fossil from these deposits has been removed from its original stratigraphic, taphonomic, or paleoenvironmental context (provenance), making it scientifically invalid in most instances. Here, artificial fill sediments, at least in part, consist of reworked and compacted sediments originating from Hancock Park, which explains the presence of some fossil fragments recovered from the sediment stratum capping the project site.

It is also important to note that early paleontological investigations prioritized salvage or collection of large fossil specimens or extinct fauna, with little regard for the small-sized fossil fragments or smaller taxa (e.g., rodents, plants, insects, etc.). Asphalt or asphalt-rich sediments containing small fossils may have been discarded or ignored by early investigators and later reworked as fill at the site. Although considered scientifically less valuable or scientifically nonsignificant in *most* circumstances (SVP 2010), fossils from artificial fill and reworked sediments originating from within Hancock Park may still provide scientifically important information due to level of fossil preservation that allows radiocarbon dating of specimens from the site to help elucidate the changing environment during the late Pleistocene and Holocene of Southern California. Therefore, Recent artificial fill and reworked sediments originating from Hancock Park have a high potential to produce significant paleontological resources and are immediately underlain by "native" geologic units that also have a high potential for scientifically significant fossils.

7.2.4.2 LATE PLEISTOCENE OLDER ALLUVIUM (QAO)

Yerkes and Graham (1997) map late Pleistocene older alluvium (Qao) at the surface of the project site (see **Error! Reference source not found.**); however, the uppermost strata of older alluvium likely have been partially replaced by artificial fill/reworked sediments to 1- to 3-foot depth or 1- to 8-foot depth within Hancock Park (see above). Older alluvium consists of slightly to moderately consolidated to moderately to well consolidated (stiff to very stiff) clays with some dense silt and silty sand deposits (Campbell et al. 2014; Dibblee and Ehrenspeck 1991; Shannon and Wilson, Inc. 2022; Yerkes and Graham 1997). These deposits have subsequently been uplifted and variably dissected at the surface (Campbell et al. 2014; Dibblee and Ehrenspeck 1991; Yerkes and Graham 1997). The thickness of older alluvium varies across the Los Angeles Basin (Woodring et al. 1946; Yerkes et al. 1965). For example, deposits of sands, clay, gravel, and angular rubble are approximately 40 to 190 feet thick (only a subset of that thickness is classified as older alluvium) within the Salt Lake Oil Field immediately north of and

adjacent to Hancock Park (Stock and Harris 2007); however, most asphalt or asphalt-saturated alluvial sediments that have

yielded Rancholabrean fossils are from 13 to 20 feet bgs (Shannon and Wilson, Inc. 2022), but possibly range from near the surface to approximately 40 feet bgs (AECOM 2016b).

The older alluvium within Hancock Park has been equivalated or correlated to various informal or formal late Pleistocene geologic units by previous researchers. For example, Grant and Sheppard (1939) suggest that the local older alluvium represents marginal deposits of the Hollywood alluvial fan that radiated off the southern border of the Santa Monica Mountains. Conversely, Woodring et al. (1946) equate the "Palos Verdes Sand," an informal unit of nonmarine, alluvial deposits overlying marine terraces exposed in the Palos Verdes Hills/San Pedro area to the west (i.e., also referred to the "Upper San Pedro Series" by Arnold and Arnold [1902]), as comparable to older alluvium observed at Hancock Park. Based on the work of Woodring et al. (1946), the stratigraphy of asphalt-saturated deposits has been interpreted by Woodard and Marcus (1973, 1976) and Shaw and Quinn (1986), who divide the "Palos Verdes Sand" into three unnamed members, the latter of which contains three additional unnamed submembers based on lithology, the types of fossils and inferred paleoenvironment, and the thickness of asphalt pipes. AECOM (2016b) and Shannon and Wilson, Inc. (2014, 2022) refer to the older alluvium as the "Lakewood Formation," which extends to 12 to 16 feet bgs, with a maximum thickness of approximately 40 feet. For the sake of simplicity and congruence with geologic mapping, SWCA retains the geologic designations of Quinn (1991), Dibblee and Ehrenspeck (1991), Yerkes and Graham (1997), and Campbell et al. (2014), who refer to it simply as old alluvial fan deposits or older alluvium that originated from a northwestern source during the late Pleistocene (similarly to the interpretations of Grant and Sheppard [1939]) that overlies the San Pedro Sand and was subsequently uplifted during the early Holocene (Stock and Harris 2007).

Since the onset of geologic investigations into the petroleum reservoirs within the Los Angeles Basin, geologists have reviewed the structural deformation of the Pleistocene strata overlying the Miocene and Pliocene marine rocks containing petroleum. Given the northwest-southeast trend of fossiliferous sites within Hancock Park, the asphalt springs may originate from a subsurface fault along West 6th Street (Stock and Harris 2007). Accounts by Eaton (1928) point out that the early Pleistocene strata are deeply eroded and sloped, suggesting the same tectonic forces that caused considerable folding and faulting of the deeper Miocene and Pliocene marine rocks within the subsurface of the Los Angeles Basin were still active during the early Pleistocene, as evidenced by similar deformed marine and nonmarine deposits from the early Pleistocene. Horizontal beds of late Pleistocene older alluvium unconformably overlie the deformed beds of early Pleistocene (i.e., San Pedro Sand) and older strata (Stock and Harris 2007). The stratigraphic succession and orientation of the Pleistocene sediments may be relevant for understanding the paleoenvironmental and tectonic changes that occurred between the early and late Pleistocene that resulted in the development of asphalt pools at the surface, trapping or miring organisms, and the subsequent burial of organic remains by alluvial or fluvial processes (i.e., alluvial fans and stream channels of the Los Angeles and San Gabriel Rivers) at the surface during the late Pleistocene and early Holocene. Despite the near horizontal stratigraphy of older alluvium, geotechnical investigations indicate that asphalt is present within the older alluvium, seeping to the surface via fissures, fractures, and chimneys crosscutting the stratigraphy and concentrating in sandy layers (AECOM 2016b; Shannon and Wilson, Inc. 2022).

In general, equivocal non-asphaltic older alluvial deposits within Southern California have yielded similar taxa from sporadic fossil localities; however, the level of fossil preservation of both micro-fossils and macro-fossils is far less at these localities (Jefferson 1991a, 1991b; McDonald and Jefferson 2008; Miller 1971; Reynolds and Reynolds 1991; Springer et al. 2009), demonstrating the unique state of preservation at the La Brea Tar Pits. Therefore, late Pleistocene older alluvium has a high potential for producing significant paleontological resources.

7.2.4.3 EARLY PLEISTOCENE SAN PEDRO SAND

Although the early Pleistocene San Pedro Sand is not mapped at the surface within the project site, it is noted in geotechnical investigations as underlying the late Pleistocene older alluvium at depth ranges of approximately 17 to 50 feet bgs within Hancock Park (AECOM 2016b). However, other geotechnical investigations summarized by Shannon and Wilson, Inc. (2022) indicate that the San Pedro Sand may extend to depths of 65 to 94 feet bgs, indicating variation in the thickness of the older alluvium and San Pedro Sand overlying "bedrock" Fernando Formation (see below). The San Pedro Sand consists of yellow to light brown and gray, cross-bedded to massive, poorly consolidated marine pebble gravel, sand, and silty sand (Blake 1991; Dibblee et al. 2010; Dibblee and Minch 2007). The pebbles are derived mostly from Miocene hard siliceous shale and limestone. Previous and recent geotechnical investigations indicate that some asphalt is present within the matrix of the San Pedro Sand to varying degrees (AECOM 2016b; Shannon and Wilson, Inc. 2022).

During early investigations, Pleistocene-aged marine deposits in the San Pedro area were broken up into two distinct horizons, the Upper and Lower San Pedro Series, distinguished by a prominent unconformity (Arnold and Arnold 1902). The Lower San Pedro Series consists largely of gray sandstone, and Arnold and Arnold (1902) noted that these sands were deposited in a nearshore environment. The Lower San Pedro Series has been the main focus of research and is currently referred to as the San Pedro Sand (Woodring et al. 1946). The Upper San Pedro Series, consisting of a bed of lime-hardened gravel overlain by a thick layer of fine-grained sand (Arnold and Arnold 1902), is now known as the "Palos Verdes Sand" in the Palos Verdes/San Pedro geographic areas (Woodring et al. 1946), and throughout the Los Angeles Basin, it may be equivalated to late Pleistocene older alluvium, as discussed above.

The abundance of fossil specimens known from the San Pedro Sand is one of the major reasons for the importance of this unit. Fossils recovered from the San Pedro Sand include: foraminifera, bryozoans, bivalves, gastropods, scaphopods, polyplacophorans, crabs, sea urchins, sharks, rays, bony fish, turtle, cormorants, ducks, sea eagles, quail, gulls, geese, whales, bison, camels, horses, saber-toothed cats, ground sloths, elephants, and rodents (Fitch 1967; Howard 1948; Jordan and Hannibal 1923; Miller 1930; Oldroyd 1924; Woodring et al. 1946). Therefore, early Pleistocene San Pedro Sand has a high potential for producing significant paleontological resources, even without the subsequent asphalt deposits.

7.2.4.4 EARLY PLEISTOCENE TO PLIOCENE FERNANDO FORMATION

Although not mapped at the surface within the project site or its immediate vicinity, early Pleistocene to Pliocene Fernando Formation is mapped at the surface near downtown Los Angeles (Campbell et al. 2014; Dibblee and Ehrenspeck 1991) and is present at depth throughout the Los Angeles Basin. Previous geotechnical investigations summarized by AECOM (2016b) and Shannon and Wilson, Inc. (2022) indicate that the Fernando Formation is present in the subsurface at depths as shallow as 65 feet bgs and may extend to depths of 120 feet bgs. The Fernando Formation consists of light olive brown and light yellowish brown to dark yellowish brown, clayey siltstone, fine- to medium-grained sandstone, and pebbly conglomerate of marine origin, which is massive, highly weathered, and oxidized and becoming darker in color, more massive, unoxidized, and more lithified with depth (Campbell et al. 2014; Dibblee and Ehrenspeck 1991; Lamar 1970; Shannon and Wilson, Inc. 2022). The Fernando Formation has yielded marine and nonmarine fossils and is generally regarded as having the potential to yield fossils. It is also a significant petroleum reservoir for the Los Angeles Basin, with petroleum seeping through fractures to the surface. Fossil localities from surface exposures from this unit have yielded foraminifera, sponges, corals, brachiopods, bryozoans, scaphopods, gastropods, bivalves, cephalopods, fiddler crabs, sea urchins, sharks, bony fish, birds, unidentifiable mammals, and plants (Clarke et al. 1980; Groves 1992; Huddleston and Takeuchi 2006; Morris 1976; Paleobiology Database 2022; Schoellhamer et al. 1981; University of California Museum of Paleontology 2022; Woodring 1938). Therefore, the early

Pleistocene and Pliocene Fernando Formation has a high potential to yield significant paleontological resources.

7.2.5 Paleontological Site Visit

To supplement SWCA's review of existing conditions to inform the impact assessment and proposed avoidance and minimization measures, SWCA's Lead Paleontologist, Mathew Carson, M.S., verified information and data with the Page Museum curators, collections managers, and preparators during site visits in September 2022. An additional site visit was conducted by SWCA's Principal Paleontologist Russell Shapiro, Ph.D. in October 2022. The focus of the site visits was to confirm the latest paleontological data, as well as to discuss mitigation strategies from adjacent projects within and immediately adjacent to the La Brea Tar Pits/Hancock Park. The Page Museum staff provided SWCA with raw data regarding the number of fossil specimens recovered from each pit or excavation site within Hancock Park (see Figure 6), as well as confirmed that the published field and laboratory procedures used on adjacent projects, such as Academy Museum of Motion Pictures Project (ArchaeoPaleo Resource Management, Inc. 2014) or the Westside Subway Extension Project (Los Angeles County Metropolitan Transportation Authority 2011), may either be outdated or may not capture fully the most recent or preferred protocols for the salvage and processing of fossils observed in asphaltum. These standard procedures include:

- George C. Page Museum of La Brea Discoveries. 2011. *Paleontological methods and mitigation of fossils in vicinity of Hancock Park*. 16 p.
- George C. Page Museum of La Brea Discoveries. 2011. *Techniques for excavation, preparation and curation of fossils from the Project 23 salvage at Rancho La Brea: A Manual for the Research and Collections Staff of the George C. Page Museum*. 34 p.
- Los Angeles County Metropolitan Transportation Authority. 2011. *Westside Subway Extension Project. Wilshire/Fairfax Station Construction. Paleontological Resources Extraction*. 31 p.

Based on results of the discussion with the Page Museum staff, SWCA uses these procedures as more general guidelines (as opposed to definitive standard operating procedures) to inform the analysis, define paleontological resource impacts, and determine appropriate avoidance and minimization measures.

8 IMPACT ASSESSMENT

SWCA conducted this assessment to analyze the potential for adverse impacts to significant paleontological resources resulting from the project's construction. In summary, the La Brea Tar Pits represents a world-renowned fossil site that has yielded millions of significant fossils. At the time of this paleontological resources study, the project is still in the conceptual stages, and the full extent and depth of ground-disturbing activities is unknown. Nonetheless, a review of the existing conditions at the site indicates that the entirety of Hancock Park contains a veneer of artificial fill overlying older alluvium that is subsequently underlain by the San Pedro Sand and Fernando Formation at greater depths.

Asphalt deposits seeping to the surface through the artificial fill from the underlying geologic units may contain fossils. The thickness of fill and disturbed sediments, which may contain reworked but scientifically important paleontological resources, likely varies across the site (see Millington and Dietler [2023]), extending to depths of 8 feet bgs in some areas, or as shallow as 3 feet bgs in others. Generally, older alluvium, San Pedro Sand, and Fernando Formation have high paleontological potential throughout their extents within the Los Angeles Basin, and within Hancock Park, artificial fill or previously disturbed also have a high paleontological potential. Regardless of the site's stratigraphy, asphalt pools, seeps, and

chimneys have yielded a substantial proportion of the fossils recovered from Hancock Park, particularly in the uppermost 40 feet of sediments. Therefore, significant paleontological resources may be impacted by construction or implementation of the project regardless of depth, since ground-disturbing activities associated with the construction of the project have the potential to impact asphalt seeps containing aggregates of fossils.

Based on the results of this assessment, the preliminary conceptual site design, and the estimated depth of ground disturbances, all ground-disturbing activities may result in adverse direct or indirect impacts to significant paleontological resources. Any fossils encountered during ground disturbances would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA.

9 CONCLUSIONS AND MITIGATION RECOMMENDATIONS

This analysis included a review of asphalt pit and fossil locality data from multiple sources, including published scientific literature; online fossil locality database results; previous paleontological resources assessments; museum records search results from the Museum of Natural History; regional and local geologic maps; and subsurface geotechnical/borehole data. Based on the results of this assessment, SWCA determined that the entirety of Hancock Park contains a veneer of artificial fill overlying older alluvium that is subsequently underlain by the San Pedro Sand and Fernando Formation at greater depths. Recent artificial fill and previously disturbed sediments originating from within Hancock Park, older alluvium, San Pedro Sand, and Fernando Formation all have a high potential for scientifically important fossils. These deposits may also be saturated with asphaltum that may contain an abundance of fossil specimens, especially from 13 feet to 20 feet bgs but possibly to depths of approximately 40 feet bgs.

Any fossils encountered during ground-disturbing activities could be at risk for damage or destruction from such activities, which could constitute a significant impact under CEQA, depending on the nature of the fossil encountered. The implementation of appropriate feasible mitigation measures prior to and during ground-disturbing activities would ensure that fossils, if encountered, are assessed for significance and, if significant, salvaged to the extent feasible for laboratory analysis (and eventual) curation within the Page Museum.

Feasible mitigation measures would include (but is not limited to) preparation and implementation of a Paleontological Resources Management Plan (PRMP) by a Qualified Professional Paleontologist (Project Paleontologist). Because the engineering, design, and grading plans for the project have not been finalized, it is not feasible and impractical to prepare a PRMP at this time. After finalization of the engineering, design, and grading plans, preparation and implementation of the PRMP by a Project Paleontologist, as well as other appropriate mitigation measures outlined below, would reduce adverse impacts to less-than-significant levels, pursuant to CEQA.

SWCA recommends the following mitigation measures, which have been developed in accordance with and incorporate the performance standards of the SVP (1995, 2010), state and local regulations, and best practices in mitigation paleontology (Murphey et al. 2019).

1. **Retain a Qualified Professional Paleontologist (Project Paleontologist):** Prior to the start of construction and/or ground-disturbing activities, a Qualified Professional Paleontologist (Project Paleontologist) shall be retained who meets or exceeds the professional standards defined by the SVP (2010), and who has specific experience overseeing mitigation projects in Pleistocene deposits of the Los Angeles Basin. The SVP (2010:10) defines a qualified professional paleontologist as: “a practicing scientist who is recognized in the paleontological community as a professional and can demonstrate familiarity and proficiency with paleontology in a stratigraphic context.” The Project Paleontologist shall have a graduate degree in paleontology or geology,

and/or a publication record in peer reviewed journals; have demonstrated competence in field techniques, preparation, identification, curation, and reporting; have at least two full years of professional experience as assistant to a qualified professional paleontologist with administration and project management experience (supported by a list of projects and referral contacts); have proficiency in recognizing fossils in the field and in determining their significance; have expertise in local geology, stratigraphy, and biostratigraphy; and have experience collecting vertebrate fossils in the field (SVP 2010). The Project Paleontologist and Page Museum curators and collections managers shall meet regularly over the life of the implementation of the project to address any outstanding questions or concerns that arise during mitigation efforts to ensure effective communication and coordination. The Project Paleontologist shall oversee all regulatory compliance measures, shall oversee mitigation protocols related to paleontological resources, and shall be a point of contact for the Page Museum curators and County officials. A professional resume or curriculum vitae of the Project Paleontologist shall be submitted for review to the curators of the Page Museum (on behalf of the Museum of Natural History, as the County departmental unit) for approval prior to the start of preconstruction ground-disturbing activities.

2. **Prepare a Paleontological Resources Management Plan:** After finalization of the engineering, design, and grading plans for the proposed project and prior to the start of preconstruction ground-disturbing activities, a Paleontological Resources Management Plan (PRMP) shall be prepared by the Project Paleontologist and submitted to the Page Museum curators, who shall review and approve the final PRMP on behalf of the County and Museum of Natural History. The PRMP shall define the processes and procedures for paleontological monitoring and fossil excavation based on the nature of ground-disturbing activities required for project. The PRMP shall:

    a. Incorporate the results of this paleontological resources technical report (Carson et al. 2022), the final geotechnical investigation, and the final engineering/grading plans for the project.

    b. Require all construction personnel to attend a Worker Environmental Awareness Program (WEAP) training to be presented by the Project Paleontologist, or their designee.

    c. Define the processes and procedures for coordinating and communicating with (including but not limited to) the contractors, consultants, County officials, and Museum of Natural History (specially, the Page Museum curators and collections managers), when construction activities would be halted due to discovery and subsequent salvage efforts during ground-disturbing activities, and when regularly scheduled meetings between the Project Paleontologist and the Page Museum curators and collections managers would be required.

    d. Outline a procedure whereby mechanical excavation is conducted to remove any non-fossil-bearing sediments or soils subject to environmental soil remediation, such that adequate time is afforded to identify fossil localities and to conduct scientific salvage operations to a feasible extent (see Millington and Dietler 2023); the timing of scientific fossil salvage operations during initial grading should be given special considerations in the PRMP such that delays to earthwork activities are minimized while allowing paleontological material to be salvaged at an acceptable level that retains the scientific integrity of the discoveries.

    e. Require full-time paleontological monitoring by qualified paleontological monitors who meets the standards of the SVP (2010) and shall be supervised by the Project Paleontologist; qualified paleontological monitors shall have the authority to temporarily halt construction activities to record and salvage fossil discoveries as they are unearthed to allow for potentially significant fossils to be collected with their scientific integrity intact to the extent feasible and practical.

f. Discuss unanticipated fossil discovery and communication protocols if paleontological resources are discovered by non-paleontology staff working on the project in instances where paleontological monitors are documenting or recording paleontological resources discovered elsewhere within the project site.

g. Discuss feasible monitoring procedures for each of the different ground-disturbing activities, including but not limited to active observation or inspection of sediments during active ground disturbances, whether they be trenching, grading, excavating, drilling, or some other activity that disturbs sediments; inspection of sedimentary spoils spiles or cuttings, as well as backfill originating from Hancock Park that may contain asphaltum or fossil material; and/or matrix screening of spoils for small or microfossils as needed.

h. Define fossil salvaging procedures, including but not limited to outlining the treebox method for asphaltum bearing large accumulations of fossils, salvaging of isolated fossils, matrix screening in the field for microfossils, and chain-of-custody procedures for transferring the fossil discoveries to the Page Museum curators or collection managers as they are exhumed from the project site. Because of the unique conditions of the La Brea Tar Pits and the chemical considerations of working with asphaltum fossil deposits, any paleontological resource discoveries shall remain on-site with the Page Museum. The paleontological monitor shall record pertinent geologic data and collect appropriate sediment samples from any fossil localities.

i. Require the Project Paleontologist to prepare a report of the findings of the monitoring efforts within 90 days after construction is completed.

3. **Conduct Worker Training.** The Project Paleontologist shall develop and present a WEAP training to educate the construction crew on the legal requirements for preserving fossil resources, as well as the procedures to follow in the event of an unanticipated fossil discovery. This training program shall be given to the crew before ground-disturbing work commences and shall include handouts to be given to new workers as needed.

4. **Monitor for Paleontological Resources:** Full-time monitoring shall be required during all ground-disturbing activities (including artificial fill or previously disturbed sediments), regardless of depth. Additionally, special considerations shall be given to the project design elements and geotechnical and soils remediation or hazard reduction recommendations, including but not limited to the paleontological screening of tar sands prior to disposal or treatment. Procedures and protocols for paleontological monitoring and fossil salvage shall be outlined in the PRMP. Monitoring shall:

a. Be conducted by a qualified paleontological monitor who meets the standards of the SVP (2010) and shall be supervised by the Project Paleontologist, who shall coordinate with the Page Museum curators and collections managers and County officials. The Project Paleontologist may periodically inspect construction activities to recommend adjusting the level of monitoring in response to subsurface conditions; however, modifications, such as increasing, reducing, or ceasing of paleontological monitoring, or any changes of the implementation of the PRMP, should be approved by Page Museum curators and the County Museum of Natural History.

b. Include inspection of exposed sedimentary units during active excavations, grading, tar sand removal, and any other ground-disturbing activity that has the potential to impact sediments capable of preserving significant fossils. The Page Museum curators (or their representatives) and the paleontological monitor shall have authority to temporarily divert activity away from exposed fossils to evaluate the significance of the find and, shall the fossils be determined significant or likely significant, professionally and efficiently

recover the fossil specimens and collect associated data while minimizing delays. Data collection procedures may require the support of construction contractors to carefully and efficiently collect field data and extract the fossils to allow construction to continue.

c. Require grading and earthwork contractors to follow the guidance of Page Museum staff or the Project Paleontologist regarding the collection and/or extraction of paleontological resources. The paleontological monitor shall record pertinent geologic data and collect appropriate sediment samples from any fossil localities. Recovered fossils shall be directly retained by the Page Museum for later analysis, laboratory preparation, and eventual curation if deemed significant or important by the Page Museum curators or collection managers.

5. **Prepare a Paleontological Resources Monitoring Report:** Upon conclusion of ground-disturbing activities, the Project Paleontologist overseeing the implementation of the PRMP, including paleontological monitoring and fossil salvaging, shall prepare a final monitoring report that documents the paleontological monitoring efforts for the project and describes any paleontological resources discoveries observed and/or recorded during the life of the project. The final monitoring report and any associated data pertinent to the salvaged fossil specimen(s) shall be submitted to the Los Angeles County Museum of Natural History within 90 days after construction is completed.

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APPENDIX A

Key Personnel Resumes

MATHEW CARSON, M.S., LEAD PALEONTOLOGIST

Mr. Carson is a cultural and paleontological resources project manager who maintains a comprehensive understanding of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), as well as other regulations pertaining to cultural and paleontological resources. He provides paleontological expertise on projects spanning transportation, energy, mining, public works, transmission lines, education, and development throughout California. Additionally, Mr. Carson exceeds the qualifications of a Qualified Professional Paleontologist according to the guidelines of the Society of Vertebrate Paleontology and is listed as a Principal Investigator on SWCA's Bureau of Land Management California Paleontological Resources Use Permit. He has authored numerous paleontological assessments, as well as sections of NEPA/CEQA environmental documents. He has successfully managed cultural and paleontological projects from their initial planning to their final construction.

YEARS OF EXPERIENCE

8.5

EXPERTISE

Project management

Vertebrate and invertebrate paleontology, micropaleontology, and paleobotany

CEQA/NEPA compliance for cultural and paleontological resources

Paleontological technical studies, mitigation plans, construction monitoring, salvages, final reports

EDUCATION

M.S., Geology (Paleontology); Bowling Green State University, Ohio; 2013

B.S., Geology (Paleobiology); Bowling Green State University, Ohio; 2009

PERMITS

U.S. Bureau of Land Management California Paleontological Resource Use Permit (CA-22-08P), Principal Investigator

MEMBERSHIPS

Member, Paleontological Society

Member, Society of Vertebrate Paleontology

SELECTED PROJECT EXPERIENCE (∗ denotes project experience prior to SWCA)

Paleontological Resources Monitoring and Mitigation Program for the 3rd and Fairfax Mixed-Use Development Project; Holland Partner Group; Los Angeles, California. The proposed project is a mixed-use development consisting of residential units and retail commercial space. *Role: Senior Paleontologist and Project Manager. Managed the overall project, prepared the paleontological mitigation and monitoring plan, and provided paleontological technical oversight during monitoring.*

Paleontological Resources Monitoring and Mitigation Program for the 3rd and Pacific Mixed-Use Development Project; Holland Partner Group; Long Beach, California. The proposed project is a mixed-use development consisting of residential units and retail commercial space. *Role: Senior Paleontologist and Project Manager. Managed the overall project, prepared the paleontological mitigation and monitoring plan, and provided paleontological technical oversight during monitoring.*

City of Chino Hills Technical Studies and EIR for General Plan Update; EcoTierra Consulting Inc.; San Bernardino County, California. Due to adoption of the 6th Cycle Housing Element, the proposed project consists of a program-level review of the City of Chino Hills, as well as a project-level review of nine specific sites, to update the City of Chino Hills 2015 General Plan. *Role: Senior Paleontologist and Task Lead: Managed the paleontology task oversaw paleontological surveying and prepared final report..*

Tapia Ranch Project; Private Developer and PlaceWorks; Los Angeles County, California. The proposed project would include 405-unit single-family residential lots and associated public works facilities. Approximately 74 percent of the 1,165-acre On-Site/In-Tract part of the project site (861.4 acres) would remain in its current undeveloped natural condition. *Role: Senior Paleontologist/Technical Lead. Conducted a paleontological resources assessment.*

*Prima Deshecha Landfill Landslide Remediation Project - Phase D; County of Orange Integrated Waste Management Department; City of San Juan Capistrano, California. Project consisted of mass grading efforts to remediate landslides. The landfill is administered by the County of Orange Integrated Waste Management Department. *Role: Senior Paleontologist/Project Manager. Oversaw paleontological monitoring efforts, assessed the significance of fossil discoveries, and provided weekly reports to the County of Orange. Efforts resulted in the documentation and management of nearly 100 fossil sites of varying significance, including two highly significant articulated, nearly complete baleen whale fossils excavated over two months during project earthwork activities. Prepared the final Paleontological Monitoring Report and facilitated curation with John D. Cooper Center.*

Arroyo Seco Low Flow Diversion Project Cultural and Paleontological Support; City of Los Angeles Department of Public Works, Bureau of Engineering (LADPW BOE); Los Angeles County, California. The LADPW BOE is constructing several low-flow diversion (LFD) systems along the Arroyo Seco that will capture and divert dry weather flows from storm drains and divert them to sanitary sewers for treatment. *Role: Senior Paleontologist. Conducted a programmatic review of the paleontological resource potential, prepared the paleontological mitigation and monitoring plan, and provided paleontological technical oversight during monitoring.*

Los Angeles River Low Flow Diversion Project Cultural and Paleontological Support; LADPW BOE; Los Angeles County, California. The LADPW BOE is constructing several LFD systems along the Los Angeles River that will capture and divert dry weather flows from storm drains and divert them to sanitary sewers for treatment. *Role: Senior Paleontologist. Conducted a programmatic review of the paleontological resource potential, prepared the paleontological mitigation and monitoring plan, and provided paleontological technical oversight during monitoring.*

West Los Angeles Sewer Maintenance Yard Project; LADPW BOE; Los Angeles County, California. SWCA provided services under an on-call cultural resources contract. Tasks included preparation of a cultural and paleontological resources assessment reports. Work was conducted in compliance with CEQA, NEPA, and Section 106. *Role: Senior Paleontologist. Conducted a project-level review of the paleontological resource potential and prepared the technical report.*

7th Street Body Shop Replacement Project; LADPW BOE; Los Angeles County, California. SWCA provided services under an on-call cultural resources contract. Tasks included preparation of a cultural and paleontological resources assessment report. Work was conducted in compliance with CEQA, NEPA, and Section 106. *Role: Senior Paleontologist. Conducted a project-level review of the paleontological resource potential and prepared the technical report.*

Holy Cross Road Extension Project; Archdiocese of Los Angeles; Los Angeles County, California. Archdiocese of Los Angeles propose to expand their Holy Cross Cemetery onto two parcels in the Baldwin Hills area of unincorporated Los Angeles County. *Role: Senior Paleontologist and Task Lead. Tasks included preparation of a paleontological resources assessment report.*

Judson Transmission Pipeline Project; Eastern Municipal Water District (EMWD); City of Moreno Valley; Riverside County, California. SWCA provided biological, cultural, and paleontological support for CEQA compliance on behalf of the EMWD. Tasks included preparation of biological, cultural, and paleontological resources assessment reports. Work was conducted in compliance with CEQA, and other state and local regulations. *Role: Senior Paleontologist. Conducted a project-level review of the paleontological resource potential and prepared the technical report.*

*Climate Action Plan Project; Metropolitan Water District of Southern California; Multiple Counties in California. The project included the preparation of the Program Environmental Impact Report (PEIR) for the Climate Action Plan for Metropolitan Water District of Southern California. *Role: Senior Paleontologist. Mr. Carson prepared a paleontological resources assessment focused on regional paleontological studies, regional and local geologic maps, primary literature, online fossil locality databases, and the regulatory framework surrounding paleontological resources in various government jurisdictions within California.*

*High Park/Ponte Vista Residential Development Project; iStar Financial, Inc.; County of Los Angeles, California. The project, located on State Route 213, between Agajanian Drive and Fitness Drive in the San Pedro Port District, entailed the demolition of former U.S. Navy facilities and redevelopment with approximately 1,135 housing units on a 61.5-acre lot, with significant excavation operations consisting of cut/fill operations, mass grading, and sidewall cuts for retaining wall development. *Role: Paleontologist. Oversaw construction monitoring for paleontological resources.*

*Whiskey Hotel Project; Private Developer; City of Los Angeles, California. The Whiskey Hotel Project consists of construction of a new hotel located in the City of Los Angeles, California. *Role: Senior Paleontologist/Project Manager. Provided overall project management and paleontological oversight during the project's construction.*

*Echo Hotel Project; Private Developer; City of Los Angeles, California. The Echo Hotel Project, located in the city of Los Angeles, California, proposes to combine nine contiguous lots, demolish the existing commercial building, reroute an alley, and construct an eight-story hotel, with an attached restaurant, meeting space, fitness facility, and aboveground and subterranean parking. *Role: Senior Paleontologist/Project Manager. Prepared a paleontological resources assessment technical memorandum for the project.*

RUSSELL SHAPIRO, PH.D., PRINCIPAL INVESTIGATOR, PALEONTOLOGY

Dr. Shapiro is a principal investigator in SWCA's Pasadena office, supporting paleontological resource assessments and evaluations, field surveys and construction monitoring, preparation of technical reports, and peer or senior review for technical reports and mitigation plans, as well as researches and drafts paleontology sections for the environmental impact reports/statements for California Environmental Quality Act (CEQA) and/or National Environmental Policy Act (NEPA) compliance throughout California and the western United States. As a paleontology principal investigator who exceeds the definition of a Qualified Professional Paleontologist as defined by Society of Vertebrate Paleontology (SVP), Dr. Shapiro has reviewed resource planning documents for several counties in California and was the lead on the Bureau of Land Management's (BLM's) assessment of fossil resources of Northern California.

In his academic role as Professor of Geology and California State University, Chico, Dr. Shapiro teaches several paleontology courses, focusing on CEQA and NEPA regulations, field surveys, geographic information system projections, fossil recovery, budgeting, and curation. He also teaches in the annual Field Camp courses, manages the rock preparation laboratory, and maintains the microscopes.

YEARS OF EXPERIENCE

20

EXPERTISE

Project management

Paleontological resources management

CEQA/NEPA compliance

Fossil preparation

EDUCATION

Ph.D., Geological Sciences; University of California, Santa Barbara; 1998

B.S., Geology; Humboldt State University, Arcata, California; 1992

PERMITS AND MEMBERSHIPS

U.S. Fish and Wildlife Cultural Resources Use Permit

U.S. Forest Service Cultural Resources Use Permit

Bureau of Land Management Cultural Resources Use Permit

Wilderness and Remote First Aid (Red Cross Certified)

Geobiology Society; Treasurer

Society for Sedimentary Geology (SEPM); Secretary

Society for Vertebrate Paleontology

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

*N-99414 12.5-kV Distribution Facility Goodsprings-Sandy Valley; NV Energy; Clark County, Nevada. Conducted all phases of paleontological resource assessment for a transmission line replacement. These tasks included the desktop analysis of known resources, field survey of the project footprint, and follow-up reporting. *Role: Principal Investigator. Conducted field mapping.*

I-10/Robertson/National Area Circulation Improvement Project; Michael Baker International; Los Angeles County, California. SWCA conducted a cultural resources analysis, which includes a California Historical Resources Information System (CHRIS) records search, an Electronic Database Resources records search, an architectural resources survey and recording, an archaeological resources survey, and writing the Caltrans Archaeological Survey Report (ASR), Historic Property Survey Report (HPSR), and Historical Resources Evaluation Report (HRER). *Role: Principal Investigator. Desktop analysis of the geology and paleontological resources; authored the technical report.*

General Plan Update for City of Corona; City of Corona; Riverside County, California. Co-authored Paleontological Resources Technical Report based on review of geological reports, museum records, and published literature to support the proposed revision to the City's general plan. The revised general plan will guide all paleontological mitigation in the City's jurisdiction. *Role: Principal Investigator, Paleontologist, co-author of final reports.*

*Research on the Jurassic Bedford Canyon Formation; Riverside County, California. This project covers independent research on unique fossil ecosystems preserved in the Santa Ana Mountains in Riverside County. As Research Lead, Dr. Shapiro coordinates paleontologists from the Polish National Museum (Warsaw) and the Natural History Museum of Los Angeles County as well as geochemists from Caltech and the State College of Pennsylvania. The project is ongoing. *Role: Research Lead. Duties include field mapping and collection, fossil and powder preparation, and coordinating between research partners.*

City of Hope Specific Plan and EIR; PlaceWorks; Duarte, Los Angeles County, California. SWCA provided a cultural resources study which included a records search and literature review, Native American coordination, an archaeological resources field survey,

preparation of a cultural resources technical report with evaluations of potential historic properties and an assessment of potential impacts to those properties, and a paleontological resources study. The project area corresponds with the approximately 116-acre City of Hope campus, with approximately 89.5 acres in the city of Duarte and 26.5 acres in the city of Irwindale, Los Angeles County, California. This study was completed in compliance with the CEQA. *Role: Principal Investigator. Reviewed general plan and provided changes for the final draft.*

75 Howard Street; Paramount Group, Inc.; San Francisco, San Francisco City and County, California. SWCA prepared the EIR for the proposed project at 75 Howard Street, which tiered off the Transit Center District Plan and Transit Tower Final EIR. The proposed project at 75 Howard Street consists of the demolition of an existing 91 foot-tall, eight-level parking garage and the construction of a 31-story, 348-foot-tall, residential high-rise tower on the site. SWCA directed technical background studies for aesthetics, archaeology, transportation, noise, air quality, wind, and shadow and prepared and distributed a Notice of Preparation of an EIR and Initial Study, which focused on the environmental topics for which the proposed project would have less-than-significant impacts. *Role: Principal Investigator. Reviewed geological data and museum records to draft the environmental review document.*

Ann Project Paleo Study; SRK Consulting, Inc.; Nye County, Nevada. SWCA was contracted by SRK Consulting to provide a paleontological resources assessment for the Ann Project located in central Nevada. The project is located on lands administered by the U.S. Forest Service and the BLM. The project will involve the construction of a barite mine and jig plant on the site. *Role: Principal Investigator. Conducted pre-survey discussion of local geology and reviewed report.*

City of Corona General Plan Interim Technical Update and Environmental Analysis; PlaceWorks; Corona, Riverside County, California. The City of Corona initiated the process to prepare an interim technical update to its General Plan. The City's General Plan was last comprehensively updated in 2004 along with environmental analysis and is still the City's guiding land use document to the year 2025. The update did not substantially alter the outcomes of the visioning process that founded the 2004 update but ensured that all technical data and policies remain current, relevant, and effective to ensure that the document successfully guides decisions and activities carried out by the City's decision makers and City staff. SWCA provided multi-disciplinary support for this General Plan technical update and environmental analysis. *Role: Principal Investigator. Reviewed general plan and provided changes for the final draft.*

San Bernardino Web-based Countywide General Plan and EIR; PlaceWorks; San Bernardino County, California. SWCA is currently conducting cultural and paleontological resources studies supporting PlaceWorks to prepare a Web-based Countywide Plan and a PEIR for the County of San Bernardino. SWCA is providing Native American consultation support, and conducting records searches for cultural and paleontological resources to summarize the existing conditions and inform a sensitivity analysis for the plan area, which includes a Community Plan Area within unincorporated portions of San Bernardino County. *Role: Principal Investigator. Reviewed general plan and provided changes for the final draft.*

SCAG 2020 RTP/SCS Program Environmental Impact Report (PEIR); Impact Sciences, Inc.; Multiple Counties, California. SWCA was retained by Impact Sciences to provide environmental services in support of the Southern California Association of Governments PEIR for the 2020 Regional Transportation Plan/Sustainable Communities Strategy in accordance with environmental compliance procedures under federal metropolitan planning law and regulations, the CEQA statutes and guidelines, and other relevant federal and state environmental laws and regulations. SWCA is conducting biological, cultural, and paleontological resources studies in support of the PEIR. *Role: Principal Investigator. Reviewed paleontology report.*

SCE Fort Irwin Reliability Project Environmental Assessment; Southern California Edison Company; San Bernardino County, California. SWCA is providing support for this transmission line improvement project located on lands administered by the BLM and Department of Defense as well as private landowners. Services include the development of the BLM Plan of Development (POD), preparation of the Environmental Assessment (EA), and biological, jurisdictional waters, cultural, and paleontological technical studies and reports to support the EA, POD, and environmental permits. *Role: Principal Investigator. Reviewed drafts of technical reports.*

Confidential Transmission Project; Confidential Clients; California. SWCA is providing permitting and licensing support, including preparation of a PEA, for a new 230/70-kV substation, 7 miles of new aboveground 70-kV power line, 3 miles of reconductored 70-kV line, and a 230-kV interconnection in Paso Robles. Services include cultural, biological, and paleontological surveys; PEA preparation; PTC application filing support and noticing; and post-filing CEQA and permitting support. *Role: Principal Investigator. Conducted desktop analysis of geological setting and paleontological resources.*

APPENDIX B

Museum of Natural History Paleontological Records Search

CONFIDENTIAL – NOT FOR PUBLIC RELEASE

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

February 5, 2022

SWCA Environmental Consultants
Attn: Georgia Knauss

re: Paleontological resources for the La Brea Tar Pits Master Plan Project, #00063953

Dear Georgia:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the La Brea Tar Pits Master Plan project area as outlined on the portion of the Hollywood USGS topographic quadrangle map that you sent to me via e-mail on January 31, 2022.

The asphaltic deposits of Rancho La Brea contain perhaps the densest accumulation of vertebrate fossils in the world, and are unique in their occurrence in a major urban area and still being productive after more than 100 years of excavation. In fact, one localized deposit designated as Pit 91, locality LACM 6909, is still being actively excavated. The Rancho La Brea asphalt deposits are also unusual in preserving a substantial portion of the total biota, including an extensive list of fossil plants, insects, and invertebrates in addition to the justly renowned vertebrate fauna. Over 200 species of fossil vertebrates are represented in these deposits, including extinct forms of bison, camel, horse, mammoth, mastodon, ground sloths, dire wolf, lion, condor, eagle, turkey, etc. One of the earliest human skeletal remains from California has also been recovered from these deposits. Numerous holotypes have come from the Rancho La Brea deposits, including the holotype of the sabre-toothed cat, *Smilodon californicus* (now known as *Smilodon fatalis*), designated as the California state fossil. The Rancho La Brea paleobiota documents climatic change in the Los Angeles Basin during the latest Pleistocene and earliest Holocene, including the last "ice age". It is so significant that this deposit served as the basis for designating the late Pleistocene as the North American Land Mammal Age called the Rancholabrean.

There are numerous fossil localities documents within Hancock Park, of which some of the most fossiliferous are listed in the table below:

Locality Number	Location	Formation	Taxa	Depth/Elevation
LACM VP 7298	The Page Museum (collected during construction of the museum building)	Variably asphaltic silts & silty clays	Botanical; Invertebrate & Vertebrate; estimated around 10,000 specimens	159 ft above mean sea level
LACM VP 6909	Rancho La Brea. Pit # 91 at Hancock Park.	Asphaltic sands	Abundant vertebrate, invertebrate, and plant fossils	Surface – 20 feet bgs
Numerous	Los Angeles County Museum of Art,	Pleistocene fluvial deposits and	16 asphaltic fossil deposits preserving an estimated over one	Starting at 10 feet bgs

	Project 23	asphaltic sands	million specimens including one nearly complete mammoth

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

The asphaltic deposits extend in the subsurface beyond the bounds of Hancock Park, with some of the closest localities listed in the following table.

Locality Number	Location	Formation	Taxa	Depth
LACM VP 4204	SW corner of Wilshire Boulevard & Spaulding Avenue	Older alluvium (asphaltic)	Antelope (*Antilocapra*)	Unknown
LACM VP 5481	Museum Square South; SW of Wilshire Blvd. and Masselin Ave.	Palos Verdes Sand (Member C; 0.5 to 1 meter thick bed of asphalt- impregnated gravelly medium grained sandstone)	Mammoth (*Mammuthus*), tapir (*Tapirus*); horse (*Equus*); camelid (*Camelops*, cf. *Hemiauchenia*); bison (*Bison*)	8.5 m bgs
LACM VP 6345	Parcel bounded by Wilshire Blvd. to the south, Orange Grove Avenue on the west, Ogden Avenue on the east & the May Company parking structure on the north	Asphaltic sands	Bird (Aves); horse (*Equus* cf. *E. occidentalis)*	Unknown
LACM VP 7247	Westbound lane of Wilshire Boulevard just west of Curson Street	Brown asphalt impregnated silt with lenses of coarse asphaltic sand	Dire wolf (*Canis dirus*), horse (*Equus*)	Approx. 2 feet bgs
LACM VP 7297	SE corner of 6th St and S Curson Ave	Medium to coarse grained asphaltic sand grading to asphaltic clay	Botanical; Invertebrate & Vertebrate; estimated around 250,000 specimens	173-180 ft above man sea level
LACM VP 1724	Near intersection of Hauser & Wilshire Blvd	Pleistocene, asphaltic sands	Pond turtle (*Clemmys marmorata),* bird (Aves), racoon (Procyonidae), sabretooth cat (*Smilodon fatalis)*, dire wolf (*Canis dirus)*, coyote (*Canis latrans)*, pronghorn antelope (*Capromeryx minor)*, and bison (*Bison)*	8 feet bgs

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the NHMLA. It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,

Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

APPENDIX G

Methane Survey Report

METHANE SURVEY REPORT
LA BREA TAR PITS SITE MASTER PLAN
5801 WILSHIRE BOULEVARD
LOS ANGELES, CALIFORNIA

Prepared For: **LOS ANGELES COUNTY MUSEUM OF NATURAL HISTORY FOUNDATION**
900 EXPOSITION BOULEVARD
LOS ANGELES, CALIFORNIA 90007

Prepared By: **LEIGHTON CONSULTING, INC.**
17781 COWAN
IRVINE, CALIFORNIA 92614

Project No. 10890.004

January 12, 2023

Leighton Consulting, Inc.
A Leighton Group Company

January 12, 2023

Project No. 10890.004

Los Angeles County Museum of Natural History Foundation
900 Exposition Boulevard
Los Angeles, California 90007

Attention: Ms. Dawn McDivitt, Chief Deputy Director

Subject: Methane Survey Report La Brea Tar Pits Master Plan
5801 Wilshire Boulevard, Los Angeles, California

References: Los Angeles Department of Building and Safety, 2020, Site Testing Standards for Methane, Document No. P/BC 2020-101, dated January 1, 2020.

INTRODUCTION

Leighton Consulting, Inc. (Leighton) is pleased to present this Methane Survey Report for the proposed La Brea Tar Pits Master Plan project located at 5801 Wilshire Boulevard, Los Angeles, California (Site – Figure 1).

Although the property is located within the boundary of the City of Los Angeles, the property is owned by the County and is governed by County codes and regulations. The County of Los Angeles requires that a methane survey be conducted prior to issuance of permits for new buildings or enclosed structures, additions, or conversions of a building or structure to habitable or occupiable at the Site in accordance with Sections 110.3, 110.4, and 110.5 of Title 26 of the Los Angeles County Code. Los Angeles County does not have a specific set of requirements for methane testing protocols to determine the necessary level of mitigation; therefore, they rely upon Site Testing Standards for Methane described in the City of Los Angeles Department of Building and Safety (LADBS) January 1, 2020 Information Bulletin Public – Building Code (IB/P/BC) 2020-101 to assess methane conditions at the Site.

SITE DESCRIPTION AND PROJECT INFORMATION

The La Brea Tar Pits property (Site) is located at 5801 Wilshire Boulevard within the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902). The Site includes 13 acres of the eastern and northwestern portions of Hancock Park and is directly adjacent to the Los Angeles County Museum of Art (LACMA); both LACMA and the Foundation are responsible for managing separate and distinct portions of the 23-acre Hancock Park, with the Foundation responsible for the 13-acre project Site and LACMA responsible for the remainder of Hancock Park to the west of the Site boundaries. LACMA's facilities are not included in this project.

It is our understanding that the proposed La Brea Tar Pits Master Plan will consist of the renovation of the existing George C. Page Museum which is approximately 63,200 square feet (sf) in size, construction of a new two-story 40,000 sf museum building northwest of the George C. Page Museum, and other renovations and upgrades to the Lake Pit, the entrance to the property at Wilshire Boulevard and South Curson Avenue, the entrance at West 6th Street, the tar pits (Pits 3, 4, 9, 13, 61, 67, and 91, and Project 23), pedestrian paths and recreation areas, parking, and landscaping.

The existing George C. Page Museum building was constructed with a methane mitigation system beneath the foundation that has been tested on a regular basis. Methane has been detected at concentrations exceeding 50,000 parts per million by volume (ppmv) in previous monitoring events. It is anticipated that any renovations to this museum structure will keep the existing mitigation system intact.

The property on which the existing and planned museum buildings are located is 13 acres. The area of investigation required of very large properties, such as this one, may be calculated as the area of the proposed building footprint plus the area within 100 feet of the building perimeter. In this case, we assume the construction area of the new two-story 40,000 sf museum building, plus 100 feet around the perimeter, totaling approximately 160,000 sf, to be the project area requiring investigation.

LADBS Site Testing Standards for Methane require a minimum of two shallow soil gas probes per project area, set at a depth of at least 4 feet below ground surface or at a rate of one probe per 10,000 sf of project area. Additionally, deeper soil gas probe sets are required to be installed at a rate of one set per 20,000 sf of project area with the probes set at 5, 10, and 20 feet below the deepest slab/foundation or a minimum of 12 inches above the ground water table.

While the exact depth of construction and the finish grade of the new museum building has not been established, the depth of excavation may extend to approximately 6 to 10 feet below ground surface (bgs). Since shallow groundwater and asphalt sands have been encountered at the Site at a depth of approximately 6 feet bgs, only 16 shallow probes were installed at depths of 5 feet bgs or shallower during this investigation.

OBJECTIVE

The objective of our methane assessment was to evaluate the concentrations of methane in subsurface soil gas at the Site to determine necessary mitigation requirements for the proposed new construction.

SUMMARY OF WORK COMPLETED

Soil Gas Probe Installation

Leighton engaged Millennium Environmental, Inc. to install soil gas probes in 16 borings (MB-1 to MB-16) using direct push drilling equipment (Figure 1).

Soil gas probes were placed at depths between 4 and 5 feet bgs in each soil boring location. Due to shallow groundwater encountered between 6 and 8 feet bgs in previous investigations and the presence of asphalt sands and clays deeper probes were not able to be installed. The soil gas probes consisted of inert ¼-inch nylaflow tubing fitted with a porous airstone at the terminus, which were set within one foot of sand, one foot of dry bentonite above, followed by hydrated bentonite to six inches below the ground surface. The surface end of the probe was fitted with a gas-tight leurlock to prevent infiltration of water or air. Soil gas probes were allowed to equilibrate for a minimum of 2 hours prior to sampling.

Soil gas sampling points were abandoned upon completion of the second soil gas sampling event. Probe abandonment consisted of pulling the tubing from the ground or cutting the tubing as deep as possible from each location if the tubing could not be removed. Each location was sealed with hydrated bentonite and the surface was restored to its original condition.

Boring locations were accurately measured to a fixed reference point, noted on field maps, and surveyed using a Trimble Geo7X Mobile Global Positioning System (GPS) unit.

Soil Gas Probe Sampling

Soil gas samples collected from the probes were tested on October 18 and 19, 2022. The soil gas samples were analyzed in the field utilizing an RKI Eagle (Landtec equivalent) with a methane detection limit of 5 ppmv. Soil gas pressure readings were obtained from each soil gas probe using a magnahelic gauge capable of measuring 0.01 inches of water prior to testing. Barometric pressure readings were noted prior to sampling the probes and were observed to be steady during the sampling events.

RESULTS

Methane was detected at concentrations ranging from 5 ppmv to 49,000 ppmv in soil gas samples collected on October 18, 2022. Methane was detected at concentrations ranging from 15 ppmv to 50,000 ppmv in soil gas samples collected on October 19, 2022. Soil gas samples were not collected from five locations (MB-3, MD-4, MB-6, MB-11, and MB-12) due to no flow conditions encountered within clay units.

Pressure readings from the individual soil probes were measured at 0.0 inches of water, indicating that there was no significant soil gas pressure observed during this investigation.

A completed Certificate of Compliance for Methane Test Data (Form 1, Part 1) has been stamped by a Registered State of California Professional Geologist and is attached at the end of this report. A table showing the test results is included in the Certificate of Compliance for Methane Test Data (Form 1, Part 2).

CONCLUSIONS AND RECOMMENDATIONS

Methane was detected in soil gas at a maximum concentration of 50,000 ppmv during this methane survey. No measureable soil gas pressures above 0.1 inches of water were detected.

Based on the results of our methane survey, the Site would be classified as Site Design Level V. Sites within Site Design Level V are required to install an active mitigation system. The active mitigation system should include features such as an impervious membrane, a sub-slab venting system (including pressure sensors below the impervious membrane and a mechanical extraction system), a gas detection system, and an alarm system. Other miscellaneous items that should be installed include trench dams, conduit or cable seal fittings, and additional vent risers. De-watering may be required based on the depth of final construction which has no yet been determined.

It should be noted that if planned construction activities do impact the existing methane mitigation system beneath the current George C. Page Museum, the repair mitigation system will meet Site Design Level V active mitigation requirements.

This report should be submitted to Los Angeles County Department of Building and Safety with your development plans that include the appropriate mitigation for review and approval.

CLOSING

If you have any questions regarding this report, please do not hesitate to contact this office. The undersigned can be reached by phone at (949) 681-4287.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Brynn McCulloch, PG 8798
Principal Geologist

Attachments: Figure 1 – Site Plan
Form 1 – Certificate of Compliance for Methane Test Data
Table 1A – Mitigation Requirements for Methane Zone

Distribution: (1) Addressee

LEGEND

Approximate Proposed Museum Area

MB-16 Approximate Soil Boring Location

SITE PLAN

The La Brea Tar Pits Master Plan
New Museum Building
5801 Wilshire Boulevard
Los Angeles, California

Project No.	10890.004
Scale	NTS
Engr./Geol.	BFM
Drafted By	BFM
Date	January 2023

Leighton

Figure 1

FORM 1 - CERTIFICATE OF COMPLIANCE FOR METHANE TEST DATA

Part 1: Certification Sheet

Site Address: 5801 Wilshire Boulevard, Los Angeles, CA

Legal Description: Tract: _____ Lot: _____ Block: _____

Building Use: Proposed museum building

Architect's, Engineer's or Geologist's Stamp:

PROFESSIONAL GEOLOGIST
BRYNN F. McCULLOCH
No. 8798
STATE OF CALIFORNIA

Name of Architect, Engineer, or Geologist:
Brynn McCulloch
Mailing Address:
17781 Cowan, Irvine, CA 92614
Telephone:949-681-4287

Name of Testing Laboratory:
Leighton Consulting, Inc.
City Test Lab License #: TA 10069
Telephone:949-250-1421

I hereby certify that I have tested the above site for the purpose of methane mitigation and that all procedures were conducted by a City of Los Angeles licensed testing agency in conformity with the requirements of the LADBS Information Bulletin P/BC 2020-101. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the architect, engineer or geologist whose signature is affixed thereon.

Signed: _____ date 11/15/2022

Required Data:

- Project is in the (**Methane Zone**) or (Methane Buffer Zone).
- Depth of ground water observed during testing: 6 feet below the Impervious Membrane.
- Depth of Historical High Ground Water Table Elevation*: 6 feet below the Impervious Membrane.
- Design Methane Concentration**: 50,000 parts per million in volume (ppmv).
- Design Methane Pressure***: 0.0 inches of water column.
- Site Design Level: (Level I, Level II, Level III, Level IV, **Level V**) with <2 inches of water column.

De-watering:

- De-watering (**is**) (is not) required per Section 7104.3.7.
- Pump discharge rate _____ cubic feet per minute per reference geology or soil report: _____ dated _____.

Additional Investigation:

- Additional investigation (was) (**was not**) conducted. See report.

Latest Grading on Site:

- Date of last grading on site (**was**) (was not) more than 30 days before Site Testing.
- See report for explanation of the effect on soil gas survey results by grading operations.

Notes:

* Historical High Ground Water Table Elevation shall mean the highest recorded elevation of ground water table based on historical records and field investigations as determined by the engineer for the methane mitigation system.

** Design Methane Concentration shall mean the highest recorded measured methane concentration from either Shallow Soil Gas Test or any Gas Probe Set on the site.

*** Design Methane Pressure shall mean the highest total pressure measured from any Gas Probe Set on the site.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will allow flexibility and timely distribution of information to the public.

FORM 1 (CONTINUED) - CERTIFICATE OF COMPLIANCE FOR METHANE TEST DATA

Part 2: Test Data - Shallow Soil Gas Test and Gas Probe Test

Site Address: 5801 Wilshire Boulevard, Los Angeles, CA
Description of Gas Analysis Instrument(s):
Instrument Name and Model: RKI Eagle Instrument Accuracy: 5 ppmv.
City of Los Angeles Testing License #: TA 10069

Date	Time	Probe Set #	Concentration (ppmv)	Pressure (inches water column)	Probe Depth (feet bgs)	Description / Probe Location
10/18/2022	0719	MB-1	90	0.00	5	Parking lot NW
10/18/2022	0725	MB-2	65	0.00	4.5	Parking lot NW
10/18/2022	0733	MB-3	No flow	0.00	5	Parking lot SW
10/18/2022	0737	MB-4	No flow	0.00	5	Parking Lot SW
10/18/2022	0742	MB-5	4,875	0.00	4	Parking lot NE
10/18/2022	0750	MB-6	No flow	0.00	5	Parking lot SE
10/18/2022	0757	MB-7	49,000	0.00	5	Parking lot SE
10/18/2022	0800	MB-8	15	0.00	4	Parking lot NE
10/18/2022	0806	MB-9	95	0.00	5	Grassy area NE
10/18/2022	0816	MB-10	5	0.00	5	Grassy area NE
10/18/2022	0820	MB-11	No flow	0.00	5	Grassy area NW
10/18/2022	0833	MB-12	No flow	0.00	4	Grassy area NW
10/18/2022	0840	MB-13	5,000	0.00	4	Grassy area SW
10/18/2022	0844	MB-14	420	0.00	4.5	Grassy area SW
10/18/2022	0850	MB-15	250	0.00	4	Grassy area SE
10/18/2022	0903	MB-16	300	0.00	4	Grassy area SE
10/19/2022	0720	MB-1	85	0.00	5	Parking lot NW
10/19/2022	0730	MB-2	70	0.00	4.5	Parking lot NW
10/19/2022	0735	MB-3	No flow	0.00	5	Parking lot SW
10/19/2022	0740	MB-4	No flow	0.00	5	Parking Lot SW
10/19/2022	0750	MB-5	5,050	0.00	4	Parking lot NE
10/19/2022	0755	MB-6	No flow	0.00	5	Parking lot SE
10/19/2022	0803	MB-7	50,000	0.00	5	Parking lot SE
10/19/2022	0810	MB-8	25	0.00	4	Parking lot NE

TABLE 1 - DATA COLLECTION EQUIPMENT

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will allow flexibility and timely distribution of information to the public.

FORM 1 (CONTINUED) - CERTIFICATE OF COMPLIANCE FOR METHANE TEST DATA

Part 2: Test Data - Shallow Soil Gas Test and Gas Probe Test

Site Address: 5801 Wilshire Boulevard, Los Angeles, CA
Description of Gas Analysis Instrument(s):
Instrument Name and Model: RKI Eagle Instrument Accuracy: 5 ppmv.
City of Los Angeles Testing License #: TA 10069

Date	Time	Probe Set #	Concentration (ppmv)	Pressure (inches water column)	Probe Depth (feet bgs)	Description / Probe Location
10/19/2022	0815	MB-9	100	0.00	5	Grassy area NE
10/19/2022	0825	MB-10	15	0.00	5	Grassy area NE
10/19/2022	0830	MB-11	No flow	0.00	5	Grassy area NW
10/19/2022	0835	MB-12	No flow	0.00	4	Grassy area NW
10/19/2022	0843	MB-13	6,450	0.00	4	Grassy area SW
10/19/2022	0850	MB-14	590	0.00	4.5	Grassy area SW
10/19/2022	0855	MB-15	310	0.00	4	Grassy area SE
10/19/2022	0905	MB-16	200	0.00	4	Grassy area SE

TABLE 1 - DATA COLLECTION EQUIPMENT

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will allow flexibility and timely distribution of information to the public.

TABLE 1A. MITIGATION REQUIREMENTS FOR METHANE ZONE*

Site Design Level			LEVEL I		LEVEL II		LEVEL III		LEVEL IV		LEVEL V
Design Methane Concentration (ppmv)			0-100		101-1,000		1,001-5,000		5,001-12,500		>12,500
Design Methane Pressure (inches of water pressure)			≤2	>2	≤2	>2	≤2	>2	≤2	>2	All Pressures
PASSIVE SYSTEM	De-watering System [1]		X	X	X	X	X	X	X	X	X
PASSIVE SYSTEM	Sub-Slab Vent System	Perforated Horizontal Pipes	X	X	X	X	X	X	X	X	X
PASSIVE SYSTEM	Sub-Slab Vent System	Gravel Blanket Thickness Under Impervious Membrane	2"	2"	2"	3"	2"	3"	2"	4"	4"
PASSIVE SYSTEM	Sub-Slab Vent System	Gravel Thickness Surrounding Perforated Horizontal Pipes	2"	2"	2"	3"	2"	3"	2"	4"	4"
PASSIVE SYSTEM	Sub-Slab Vent System	Vent Risers	X	X	X	X	X	X	X	X	X
PASSIVE SYSTEM	Impervious Membrane		X	X	X	X	X	X	X	X	X
ACTIVE SYSTEM	Sub-Slab System	Pressure Sensors Below Impervious Membrane								X	X
ACTIVE SYSTEM	Sub-Slab System	Mechanical Extraction System [2]								X	X
ACTIVE SYSTEM	Lowest Occupied Space System	Gas Detection System [3]		X		X	X	X	X	X	X
ACTIVE SYSTEM	Lowest Occupied Space System	Mechanical Ventilation [3, 4, 5]		X		X	X	X	X	X	X
ACTIVE SYSTEM	Lowest Occupied Space System	Alarm System		X		X	X	X	X	X	X
ACTIVE SYSTEM	Control Panel			X		X	X	X	X	X	X
MISC. SYSTEM	Trench Dam		X	X	X	X	X	X	X	X	X
MISC. SYSTEM	Conduit or Cable Seal Fitting		X	X	X	X	X	X	X	X	X
MISC. SYSTEM	Additional Vent Risers [5]										X

X = Indicates a Required Mitigation Component

* Table 1A-Mitigation Requirements for Methane Zone and Table 1B-Mitigation Requirements for Methane Buffer Zone are based on Table 71 and Chapter 71 of the Los Angeles Building Code.

1. De-watering is not required when the maximum Historical High Ground Water Table Elevation, or projected post-construction ground water level, is more than 12 inches below the bottom of the Perforated Horizontal Pipes.
2. The Mechanical Extraction System shall be capable of providing an equivalent of a complete change of air every 20 minutes of the total volume of the Gravel Blanket.
3. The mechanical ventilation system shall be capable of providing an equivalent of one complete change of the lowest occupied space every 15 minutes.
4. Vent openings to comply with Item IV.B.4 on sheet 1 may be used in lieu of mechanical ventilation.
5. The total quantity of installed Vent Risers shall be increased to double the rate for the Passive System.

APPENDIX H

Low Impact Development and Hydrology Report

700 South Flower Street, Suite 2100 Los Angeles, CA 90017 213.418.0201 kpff.com

LOW IMPACT DEVELOPMENT (LID) & HYDROLOGY REPORT

La Brea Tar Pits Design and Renovation

5801 Wilshire Boulevard Los Angeles, California 90036

KPFF Job # 1900236

June 2023

OWNER:

Natural History Museum of Los Angeles County
5801 Wilshire Boulevard Los Angeles, California 90036

PREPARED BY:

KPFF Consulting Engineers
700 South Flower Street, Suite 2100
Los Angeles, CA 90017
(213) 418-0201

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Exhibits

Exhibit 1 Existing Hydrology
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Exhibit 4 Low Impact Development (LID)
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Appendices

Appendix A Vicinity Map and Rainfall Depth
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Appendix D Existing Hydrology Calculations
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Appendix F Alternate 4 Proposed Hydrology Calculations

References

County of Los Angeles Department of Public Works Low Impact Development Standards Manual dated February 2014

County of Los Angeles Department of Public Works Hydrology Manual dated January 2006

I. Project Description

The project consists of enhancing the existing La Brea Tar Pits site for the Natural History Museum of Los Angeles County. This redesign is comprised of a new pedestrian path that connects the entire site, an expansion of the existing George C. Page Museum (referred to as Page Museum hereafter), new entry canopies and pavilion plazas on Wilshire Boulevard and Sixth Street, landscape and infrastructure improvements, and a new community lawn. An alternative to the originally proposed Page Museum expansion is being evaluated that would reduce the contact with the Page Museum and enlarge the central lawn and parking lot. The total project site is approximately 15.1 acres or 58,192 square feet. The overall permeability of the site will be reduced in the proposed condition, however the site will remain over 50% permeable.

II. Purpose and Scope

Although the project is located within the limits of the City of Los Angeles (LA), the site is owned by LA County and therefore LA County is the Authority Having Jurisdiction (AHJ) for all work within the property limits. Any work in the public right of way would be subject to City of LA permitting requirements and review.

The proposed project is currently in schematic design. Due to the early nature of this design, modifications to the site plan, building footprint, and drainage calculations are anticipated between this study and the final permitted version. As a requirement of the permitting process, the project will be required to provide a current Low Impact Development (LID) and Hydrology report for County review and approval in order to validate that the final design conforms to all stormwater requirements. The purpose of this report is to evaluate the potential impacts to stormwater quality and quantity as a result of the proposed project and to demonstrate the feasibility of integrating adequate mitigation measures.

III. Drainage Concept

A. Existing Drainage

Currently, the existing project site is 68.1% pervious. For the purposes of analyzing hydrology in this study, the streets adjacent have been included in the studied area; therefore, the overall permeability of the existing hydrology study area is 59.3%. There are a few different drainage patterns on the site. In general, the site is highest on the southeast corner at the intersection of Wilshire Boulevard and Curson Avenue and slopes to the northwest of the project site towards Sixth Street and Ogden Drive. The north edge of the site slopes towards Sixth Street where runoff flows to the street gutter and ultimately to existing curb inlets located in the street. Similarly, east of the Page Museum, the landscaping slopes east towards Curson Avenue where the runoff drains north to Sixth Street. A portion of the roof runoff generated by the Page Museum also discharges directly to Curson. Within the central core of the site, area drains and catch basins collect surface runoff and discharge to an existing natural channel running through the site referred to as Oil Creek. Oil Creek ultimately drains to an existing 30-inch storm drain that connects south into a City of LA mainline located in Wilshire Boulevard. A small portion of the southeast corner of the site drains directly to Wilshire Boulevard where it is collected by existing curb inlets. Lastly, the project site includes Tar Lake, where the naturally occurring groundwater level is visible as surface water. The runoff from the southern portion of the project site drains into the Lake Pit.

Refer to Exhibit 1 – Existing Hydrology for the existing drainage area map.

B. Proposed Drainage

The proposed development is divided into four drainage management areas, corresponding with the four outfalls described above. In the proposed condition, three of the drainage management areas include biofiltration planters designed in accordance with Low Impact Development requirements (refer to "Low Impact Development" section, below):

- Drainage Area 1, which consists of runoff from the northwest portion of the site and expansion of the Page Museum, drains to Biofiltration Planter 1 and overflows to Oil Creek.
- Drainage Area 2, which consists of runoff from the parking lot and the Page Museum and the area to the east of it, drains to Biofiltration Planter 2 and overflows to Sixth Street.
- Drainage Area 3, which consists of the southern portion of the site, drains to Biofiltration Planter 3 and overflows to Tar Lake.

Drainage Area 4 consists of runoff that drains to Wilshire Blvd. Because the proposed grading intends to convey all onsite drainage to onsite stormwater management systems prior to discharging offsite, the proposed area that drains to Wilshire is comprised entirely of public right-of-way and therefore Low Impact Development stormwater management will not be required.

Refer to Exhibit 2 – Proposed Hydrology for the proposed drainage area map.

IV. Low Impact Development (LID)

The LID standards provide guidance for the implementation of stormwater quality control measures to reduce the volume of stormwater runoff and potential pollutants. These stormwater quality control measures are designed to receive the first flush event, which are the small and frequent storm events and the initial volume of stormwater runoff of the larger storm events.

A. Methodology

Calculation results are based on the Los Angeles County Department of Public Works' *Low Impact Development Standards Manual* dated February 2014. Calculations were done using the Los Angeles County approved Hydrocalc software program. HydroCalc uses the modified rational method as outlined in the Los Angeles County Public Works Department Hydrology Manual. The input requirements for HydroCalc include the drainage area, soil type, percent imperviousness, length of flow path, slope of flow path, and rainfall isohyet. HydroCalc can provide results for a range of storm events. Soil type information and rain fall depth were taken from the Los Angeles Department of Public Works Hydrology Maps. Methods for calculating Low Impact Development (LID) flow rates and volumes are based on the 85th percentile storm event, which is 1.1 inch, 24-hour storm event.

Refer to Appendix A for both soil classification Map and 85th Percentile rain fall depth.

B. Structural Best Management Practices (BMPs)

Due to the nature of the site's tar sands as well as the presence of high groundwater, infiltration is not feasible for the project. Additionally, due to the need for drought tolerant plant species, we anticipate that the irrigation demand will not be high enough to meet the 96-hour drawdown requirement for a Capture & Reuse system. Therefore, we anticipate using biofiltration to meet the LID mitigation requirements for the project.

A biofiltration planter is a shallow vegetated planter that is designed to receive and detain stormwater runoff from the building and site, filter the runoff, and eventually discharge the filtered runoff to the public storm drain system. Planters are sized to treat 150% of the required 85th percentile storm, mitigated stormwater volume. In order to protect the amended soil within the planters from tar infiltration as well as prevent high ground water from flooding the planters, the project is proposing closed bottom planters with an underdrain.

As discussed previously in this report, the onsite portion of the project site is divided into 3 drainage management areas which each include a biofiltration planter sized for the tributary area. The table below summarizes the site LID calculation.

LID Summary					
Drainage Area	**% Impervious**	**Area (ac)**	**SWQDv (cu-ft)**	**Planter Area Required (sf)**	**Planter Area Provided (sf)**
DA-1	32.96	7.07	15,271.93	4,038.00	6,495.00
DA-2	75.37	4.06	16,952.81	3,619.00	6,379.00
DA-3	30.87	2.30	4,816.95	1,048.00	10,130.00

Refer to Exhibit 4 – Low Impact Development (LID) for the drainage area map and BMP locations and Appendix B for LID calculations.

C. Non-Structural BMPs

In addition to the structural BMPs proposed, the project will incorporate the following non-structural BMPs.

1. Open Paved Areas and Planter Areas

a. Regular sweeping of all open and planter areas, at a minimum, on a weekly basis in order to prevent dispersal of pollutants that may collect on those surfaces.

b. Regular pruning of the trees and shrubs in the planter areas to avoid formation of dried leaves and twigs, which are normally blown by the wind during windy days. These dried leaves are likely to clog the surface inlets of the drainage system when rain comes, which would result in flooding of the surrounding area due to reduced flow capacities of the inlets.

c. Trash and recycling containers shall be used such that, if they are to be located outside or apart from the principal structure, are fully enclosed and watertight in order to prevent contact of storm water with waste matter, which can be a potential source of bacteria and other pollutants in runoff. These containers shall be emptied and the wastes disposed of properly on a regular basis.

2. Education and Training

Annual training of employees on property management and proper methods of handling and disposal of waste shall be provided. Employees should understand the on-site BMPs and their maintenance requirements.

3. Landscape Management

Landscaping shall be maintained using minimum or no pesticides.

4. Litter Control

An adequate number of trash receptacles will be provided and inspected regularly. Leaky receptacles will be prepared or replaced. Receptacles shall be covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post “no hazardous materials” signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site.

5. Housekeeping of Loading Docks

Loaded and unloaded items shall be moved indoors as soon as possible.

6. Catch Basin Inspection

Stormwater pollution prevention information shall be provided. Owner shall be made aware that the following is to be followed: “Property owner shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create potential discharge to storm drains.” Catch basins shall be inspected regularly.

7. Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction

Trash and waste will be handled and stored for pickup adjacent to the loading dock. This limits the potential introduction of pollutants into the site. Trash and waste pickup will occur regularly.

8. Use Efficient Irrigation Systems & Landscaping Design

Landscape is generally designed to provide an efficient and continuous irrigation system. Landscape areas are designed to include plants that are friendly to the climate of Los Angeles.

9. Storm Drain Stencil Signage

Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language to prevent dumping of improper materials into the urban runoff conveyance system.

10. Monitoring and Maintenance

a. All BMPs shall be operated, monitored, and maintained for the life of the project and at a minimum, all structural BMPs shall be inspected, cleaned-out, and where necessary, repaired, at the following minimum frequencies: 1) prior to October 15th each year; 2) during each month between October 15th and April 15th of each year and, 3) at least twice during the dry season (between April 16 and October 14 of every year).

b. Debris and other water pollutants removed from structural BMPs during cleanout shall be contained and disposed of in a proper manner.

c. The drainage system and the associated structures and BMPs shall be maintained according to manufacturer's specification to ensure maximum pollutant removal efficiencies.

V. Hydrology

A. Methodology

The following hydrology calculations follow the LA County Hydrology Manual methodology with respect to return period. Because one of the purposes of this report is to identify impacts to existing or planned storm drain systems and because a portion of the downstream storm drain system includes the conveyance capacity of existing streets, the 25-year rain event was used for analysis. The flows and volumes are calculated based on the modified rational method outlined by the Los Angeles County Public Works Department Hydrology Manual using the Los Angeles County approved Hydrocalc software. Hydrocalc uses the 50-year rainfall depth as an input and then automatically calculates the 25-year depth.

The proposed flows and volumes are then evaluated with respect to the existing flows and volumes and the delta is reviewed with respect to the planned storm drain infrastructure.

Refer to Appendix A for both soil classification Map and 50-Year rain fall depth.

B. Hydrology Results

The proposed condition will decrease the overall permeability of the project. When looking at the hydrology study area, which includes both the project site and a portion of the adjacent streets, the overall permeability decreases from 59.3% to 51.9%. (Note: the permeability for the hydrology study section of this report is lower than the permeability shown in the LID section, since LID is focusing on the project parcel area only, and the hydrology study is looking at an expanded area that includes a portion of the public right-of-way.)

When considering Drainage Area 1, the peak flow that is conveyed to the creek will decrease from 21.19 cfs to 14.94 cfs, which is a reduction in peak flow of 6.22 cfs. The total volume of runoff will decrease from 73,087 cu-ft to 52,244 cu-ft, which is a net decrease of 20,843 cu-ft.

In Drainage Area 2, where the runoff is conveyed from Curson Avenue to Sixth Street, the peak flow of stormwater runoff increases from 5.36 cfs to 7.49 cfs, which is an increase of 2.13 cfs. The total volume of runoff will increase from 43,826 cu-ft to 79,015 cu-ft for a net increase of 35,189 cu-ft. According to the City of Los Angeles Bureau of Engineering Manual, Part G – Storm Drain

Design (Manual), dated June 1973, the permeability of individual sites is not calculated based on existing conditions but is instead based on the City's Master Plan of Zoning. In the Manual, large-scale developed sites have an assumed impermeability of at least 50%, with many of the adjacent parcels falling into a category where 100% impermeability is assumed. Although the proposed project will result in an increase in impermeability, the proposed impermeability is only 40.5%, which is still less than the assumed value used for the design of the downstream infrastructure. (Note: in this case, it is appropriate to use the permeability of the project site only for the purposes of comparison and not the permeability of the larger study area that includes the public streets. Per the City's manual, street area is analyzed separately from the private properties.) As such, the proposed runoff is not anticipated to exceed the capacity of the existing storm drain conveyance system.

In Drainage Area 3, the peak flow that is conveyed to Tar Lake will increase from 9.65 cfs in the existing condition to 10.78 cfs in the proposed condition, which is an increase of 1.13 cfs. The total volume of runoff increases from 17,673 cu-ft to 21,893 cu-ft, which is a net increase of 4,310 cu-ft. Due to the natural detention capabilities of the lake, much of this increase in flow is anticipated to be retained by the lake. It is also our understanding that the Natural History Museum has an agreement with the City of Los Angeles to discharge a portion of the lake water to the sanitary sewer system, due to the water quality impact of the tar. We understand that the flow of discharge to the sewer system is metered and monitored to avoid downstream impacts to the sewer system. Because of this, it is unlikely that the increase in total runoff volume from the 25-year storm will cause the lake to overflow. However, because of the observed seasonal fluctuation in the water elevation, it is difficult to quantify the total retention capacity of the lake. As a conservative approach, therefore, we have considered the impact to downstream systems if the full increase in runoff volume were to overflow the lake. In this condition, the runoff would ultimately discharge to Wilshire Blvd. Since Drainage Area 4 also drains to Wilshire, the combined impact is discussed below.

In Drainage Area 4, the peak flow that is conveyed directly to Wilshire Blvd decreases from 1.61 cfs in the existing condition to 1.35 cfs in the proposed condition, which is a decrease of 0.26 cfs. The volume will decrease from 11,350 cu-ft to 9,567 cu-ft for a net decrease of 1,784 cu-ft. When combined with the maximum increase from Drainage Area 3, the total maximum increase in peak flow would be 12.13 cfs and the total maximum increase in runoff volume would be 31,550 cu-ft. As previously discussed, the conveyance capacity of Wilshire Blvd is designed per the City of LA's Manual based on an assumed permeability for the project site. Since the proposed permeability is less than the standard assumed permeability, the downstream system should have adequate capacity to accommodate the additional flow.

The 25-year existing and proposed peak flows and runoff volumes for the site are summarized in the table below.

Hydrology Summary			
Drainage Area	**Existing**	**Proposed**	**Delta**
DA-1			
Area (ac)	8.59	7.07	(1.52)
% Permeability	58.56	67.04	8.48
Peak Flow (cfs)	21.19	14.97	(6.22)
Volume (cu-ft)	73,086.58	52,243.53	(20,843.05)
DA-2			
Area (ac)	4.51	5.69	1.18
% Permeability	49.00	17.57	(31.43)
Peak Flow (cfs)	5.36	7.49	2.13
Volume (cu-ft)	43,826.33	79,014.93	35,188.60
DA-3			
Area (ac)	3.59	4.01	0.42
% Permeability	85.79	81.55	(4.24)
Peak Flow (cfs)	9.65	10.78	1.13
Volume (cu-ft)	17,673.44	21,982.98	4,309.54
DA-4			
Area (ac)	0.7	0.59	(0.11)
% Permeability	0	0	-
Peak Flow (cfs)	1.61	1.35	(0.26)
Volume (cu-ft)	11,350.44	9,566.80	(1,783.64)

Refer to Appendix D for Existing Hydrology Calculations and Appendix F for Proposed Hydrology Calculations.

VI. Alternate 4

An alternative to the proposed plan (referred to as Alternate 4) is being evaluated for the purposes of the Environmental Impact Report (EIR), which considers an alternate geometry to the building addition. The differences in Alternative 4 and the proposed site plan are as follows: reducing the expansion of the Page Museum to reduce the visual and physical impacts, which would decrease the proposed building footprint, expanding the parking lot, and expanding the central lawn, which would preserve a larger portion of the existing berm on the west side of the Page Museum. The overall permeability of the site in Alternate 4 is 52.5% compared with 59.5% permeability in the base analysis. When looking at the overall hydrology study area, which includes a portion of the adjacent streets, Alternate 4 has an overall permeability of 50.7%, compared to 51.9% permeability in the base analysis.

A. Low Impact Development (LID)

The drainage area limits follow the same final discharge location as the base analysis plan, with slightly altered interior limits. Following the same methodology as the proposed plan, the Alternate 4 site will be able to accommodate Low Impact Development Strategies. See table below for the summary of results.

LID Summary - Alternate 4					
Drainage Area	**% Impervious**	**Area (ac)**	**SWQDv (cu-ft)**	**Planter Area Required (sf)**	**Planter Area Provided (sf)**
DA-1	34.96	6.75	15,224.39	3,248.00	6,495.00
DA-2	80.87	6.01	26,664.89	5,689.00	6,580.00
DA-3	31.17	2.31	4,870.41	1,060.00	10,130.00

Refer to Exhibit 5 – Alternate 4 Low Impact Development (LID) for the drainage area map and BMP locations and Appendix C for Alternate 4 LID calculations.

B. Hydrology

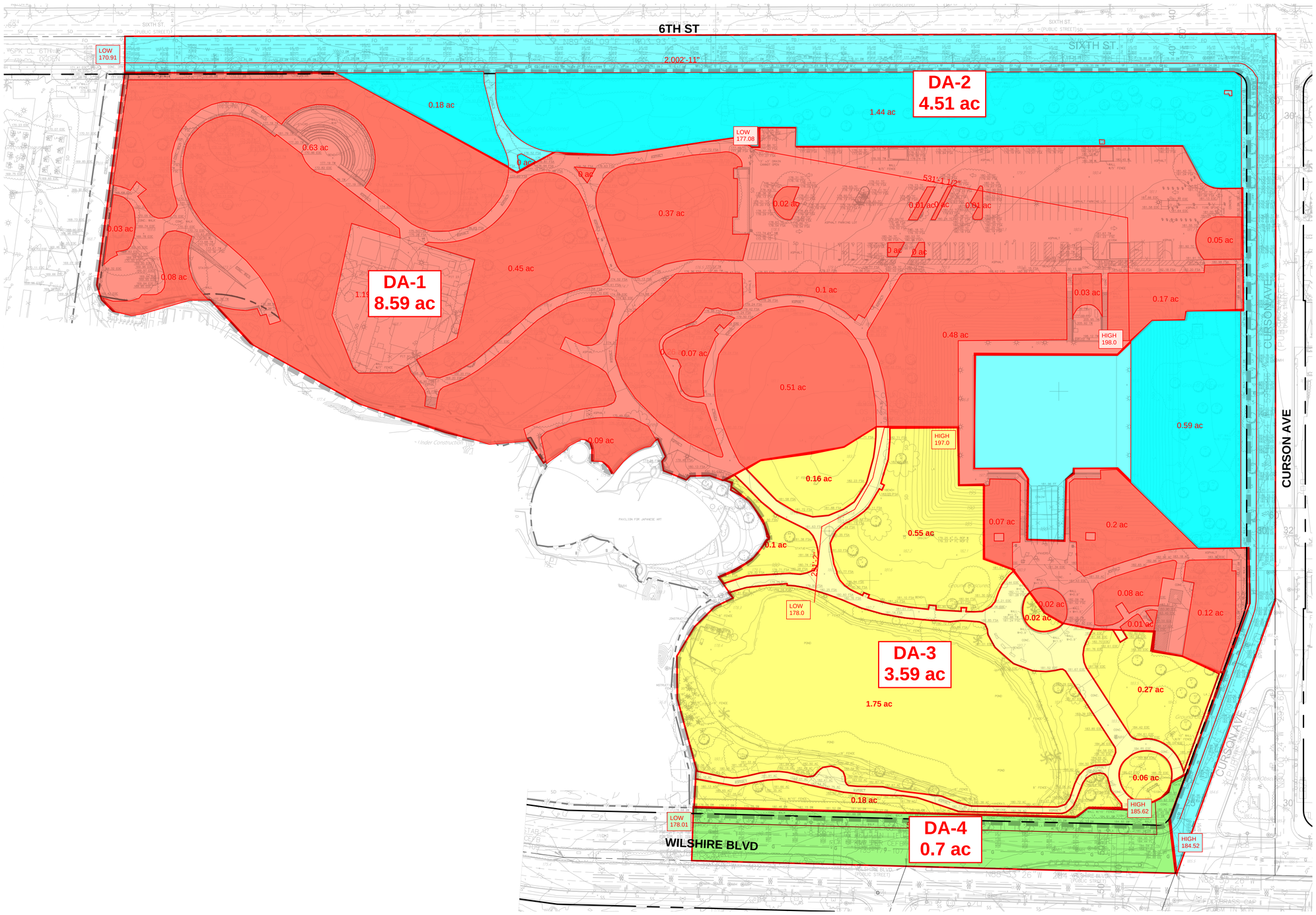
The methodology for hydrologic analysis is the same for Alternate 4 as described above for the base analysis. Because the permeability is slightly less in Alternate 4 than in the base analysis site plan, the peak flows and runoff volumes are slightly increased. However, the overall permeability is still higher than the assumed permeability used in the City's street design, therefore the additional flow is not anticipated to exceed the capacity of the existing storm drain systems.

The 25-year existing and proposed peak flows and runoff volumes for the Alternate 4 site are summarized in the table below.

Hydrology Summary – Alternate 4			
Drainage Area	**Existing**	**Alternate 4**	**Delta**
DA-1			
Area (ac)	8.59	6.75	(1.84)
% Permeability	58.56	65.04	6.48
Peak Flow (cfs)	21.19	14.30	(6.89)
Volume (cu-ft)	73,086.58	51,662.05	(21,424.53)
DA-2			
Area (ac)	4.51	6.01	1.50
% Permeability	49.00	19.13	(29.87)
Peak Flow (cfs)	5.36	7.88	2.53
Volume (cu-ft)	43,826.33	82,216.47	38,390.14
DA-3			
Area (ac)	3.59	4.01	0.42
% Permeability	85.79	81.55	(4.24)
Peak Flow (cfs)	9.65	10.78	1.13
Volume (cu-ft)	17,673.44	21,982.98	4,309.54
DA-4			
Area (ac)	0.7	0.59	(0.11)
% Permeability	0	0	-
Peak Flow (cfs)	1.61	1.35	(0.26)
Volume (cu-ft)	11,350.44	9,566.80	(1,783.64)

Refer to Exhibit 3 – Alternate 4 Proposed Hydrology for the drainage area map, Appendix D for Existing Hydrology Calculations, and Appendix F for Alternate 4 Proposed Hydrology calculations.

Exhibits



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REVISIONS

DATE	△	ISSUED FOR

DATE	06.14.2023
PROJECT NUMBER	1900236
DESIGNED BY	JB
DRAWN BY	TA
CHECKED BY	KS
SCALE	AS SPECIFIED

KEY MAP

PROJECT DESCRIPTION

LA BREA TAR PITS DESIGN MASTER PLAN

5801 WILSHIRE BOULEVARD
LOS ANGELES, CA 90036

DRAWING TITLE

EXISTING HYDROLOGY EXHIBIT

SHEET NUMBER (EXHIBIT NUMBER)

EXHB-01

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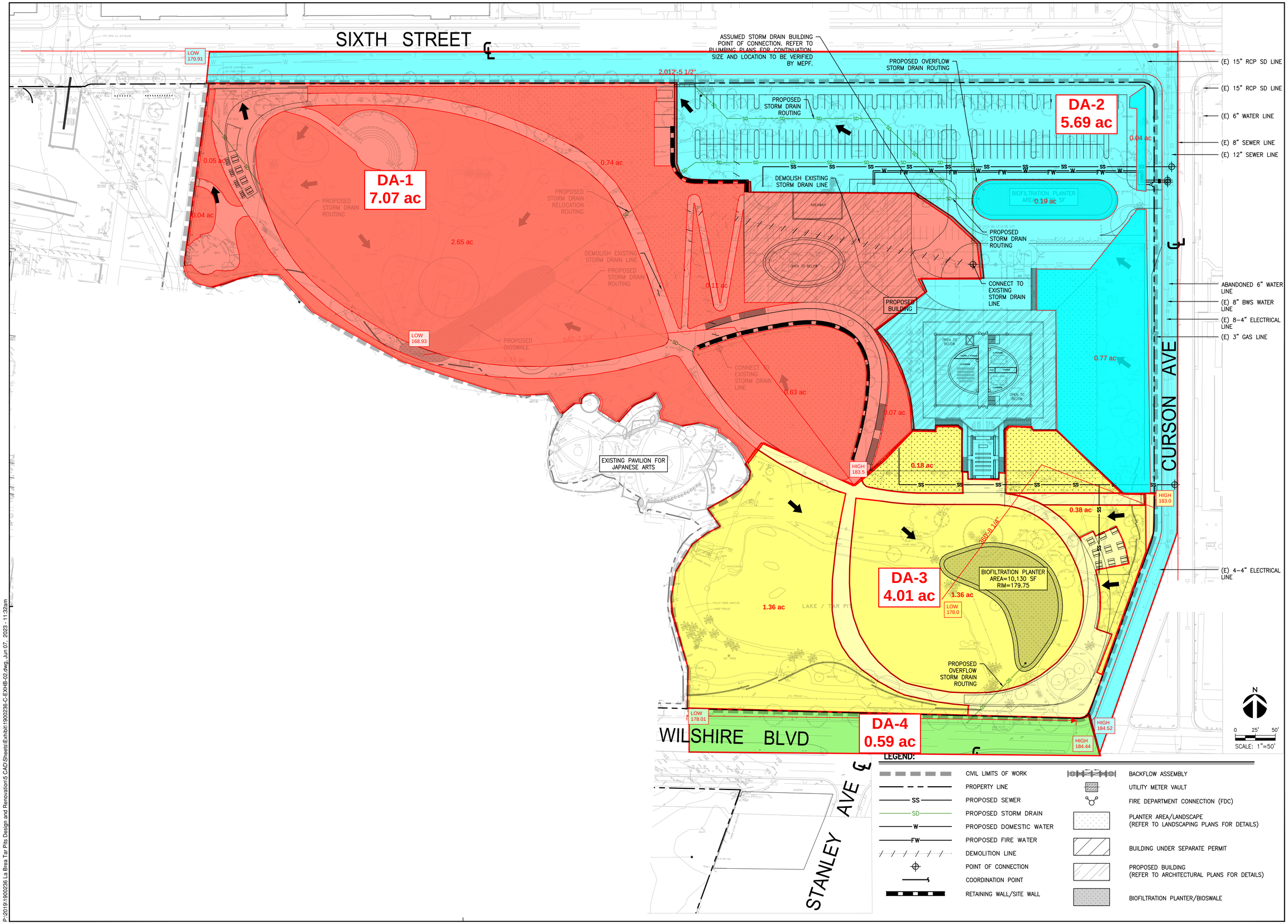

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DATE	06.14.2023
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SCALE	AS SPECIFIED

KEY MAP

PROJECT DESCRIPTION

LA BREA TAR PITS DESIGN MASTER PLAN

5801 WILSHIRE BOULEVARD
LOS ANGELES, CA 90036

DRAWING TITLE

PROPOSED HYDROLOGY EXHIBIT

SHEET NUMBER (EXHIBIT NUMBER)

EXHB-02

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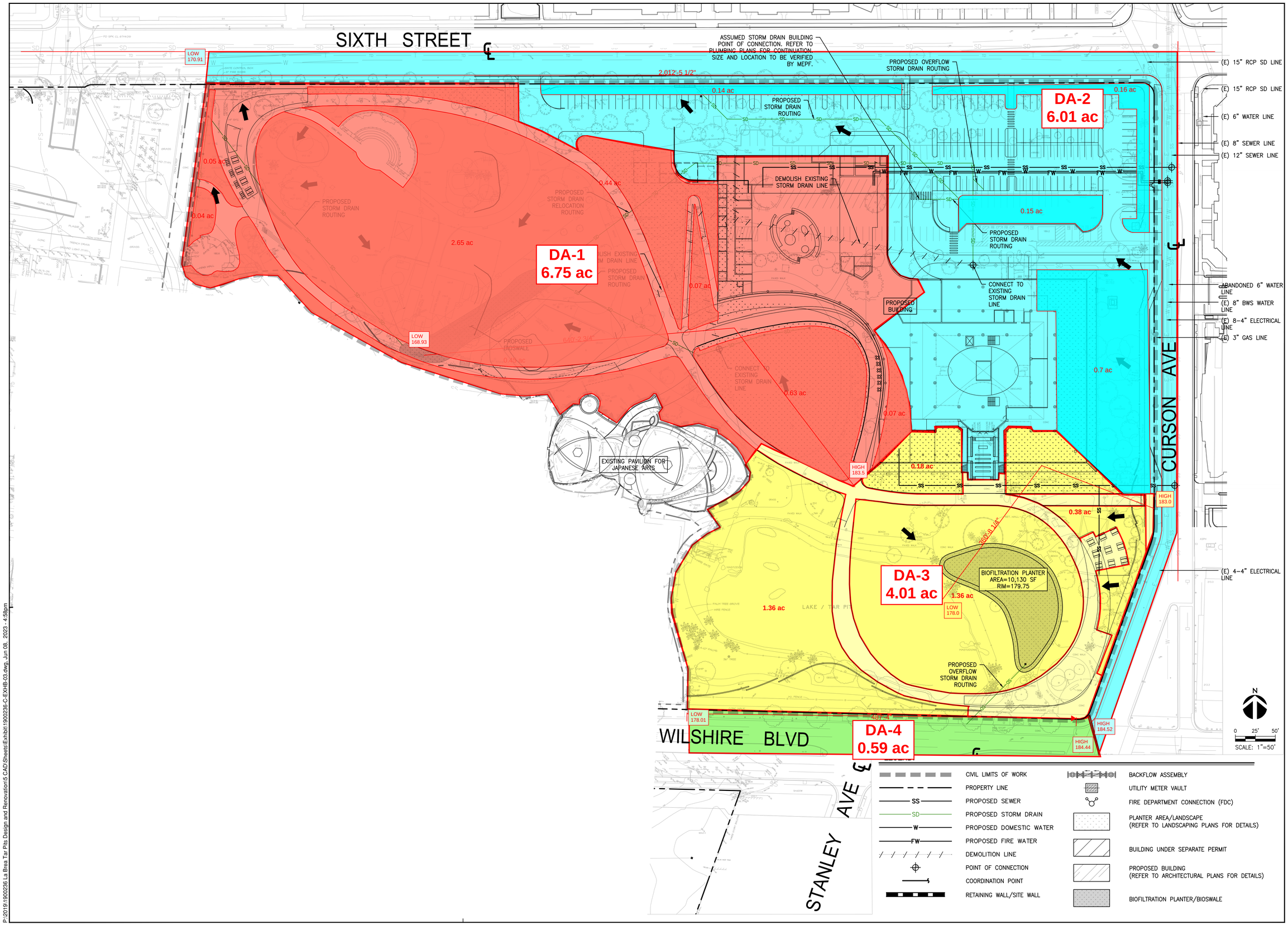

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DATE	06.14.2023
PROJECT NUMBER	1900236
DESIGNED BY	JB
DRAWN BY	TA
CHECKED BY	KS
SCALE	AS SPECIFIED

KEY MAP

PROJECT DESCRIPTION

LA BREA TAR PITS DESIGN MASTER PLAN

5801 WILSHIRE BOULEVARD
LOS ANGELES, CA 90036

DRAWING TITLE

ALTERNATIVE 4
HYDROLOGY EXHIBIT

SHEET NUMBER (EXHIBIT NUMBER)

EXHB-03

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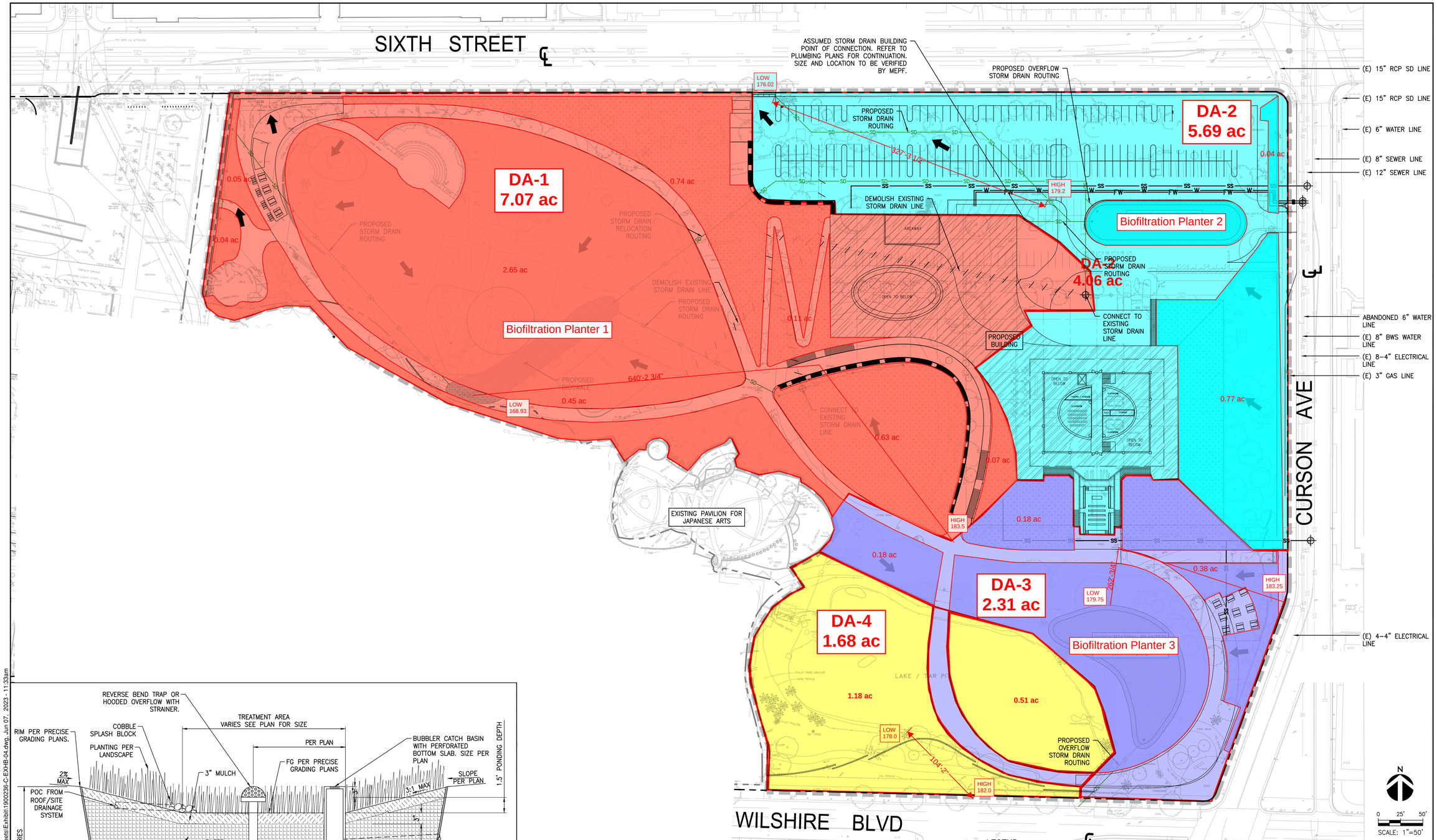

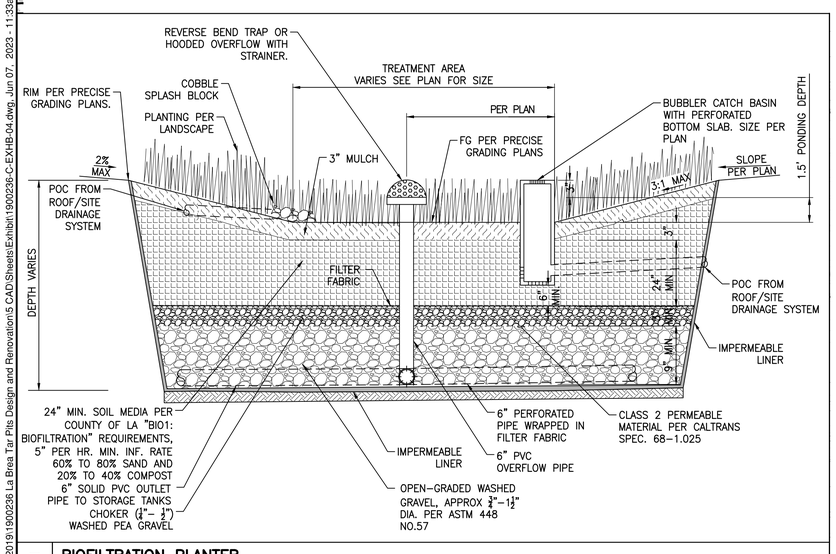

– BIOFILTRATION PLANTER

N.T.S.

LEGEND:

CIVIL LIMITS OF WORK	BACKFLOW ASSEMBLY
PROPERTY LINE	UTILITY METER VAULT
SS — PROPOSED SEWER	FIRE DEPARTMENT CONNECTION (FDC)
SD — PROPOSED STORM DRAIN	PLANTER AREA/LANDSCAPE (REFER TO LANDSCAPING PLANS FOR DETAILS)
W — PROPOSED DOMESTIC WATER	BUILDING UNDER SEPARATE PERMIT
FW — PROPOSED FIRE WATER	PROPOSED BUILDING (REFER TO ARCHITECTURAL PLANS FOR DETAILS)
DEMOLITION LINE	BIOFILTRATION PLANTER/BIOSWALE
POINT OF CONNECTION	
COORDINATION POINT	
RETAINING WALL/SITE WALL	

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SCALE	AS SPECIFIED

KEY MAP

PROJECT DESCRIPTION

LA BREA TAR PITS DESIGN MASTER PLAN

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LOS ANGELES, CA 90036

DRAWING TITLE

LOW IMPACT DEVELOPMENT (LID) EXHIBIT

SHEET NUMBER (EXHIBIT NUMBER)

EXHB-04

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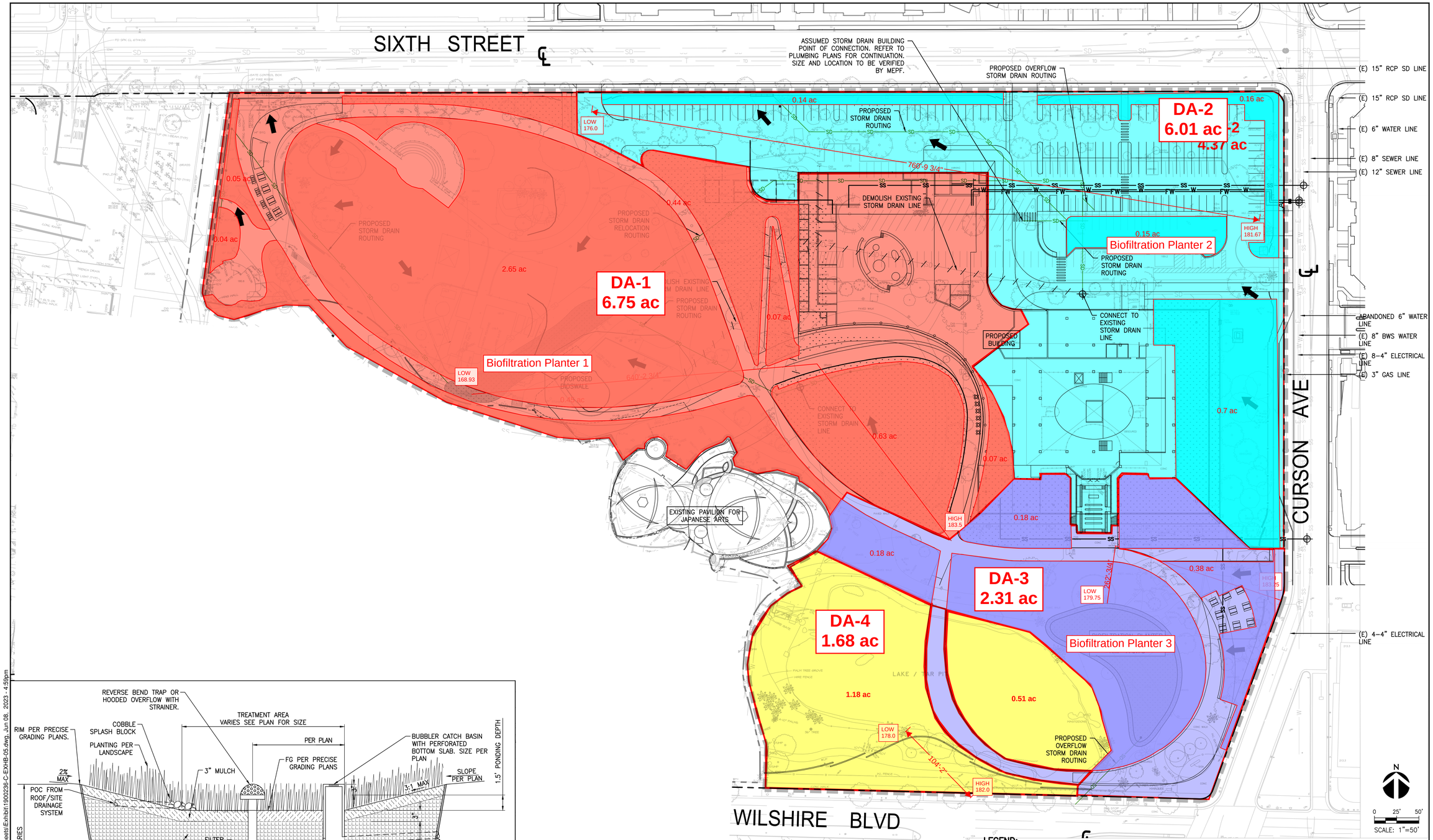

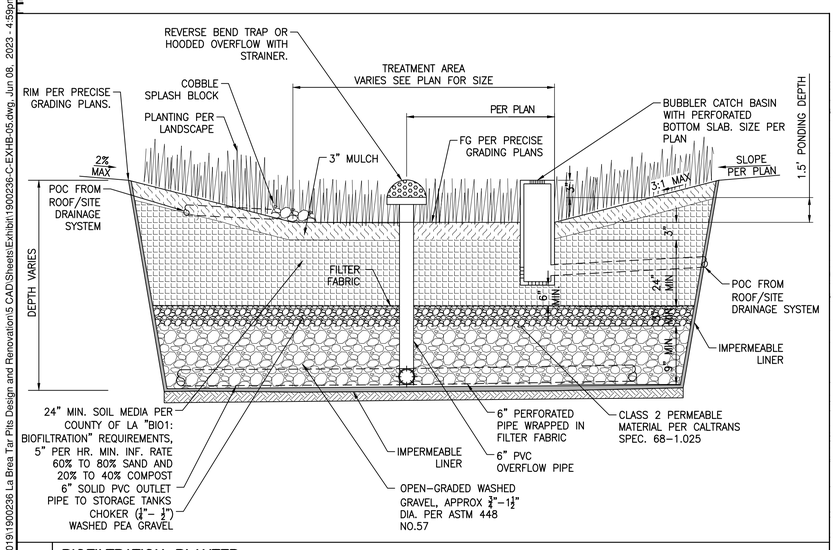

– BIOFILTRATION PLANTER

LEGEND:

CIVIL LIMITS OF WORK	BACKFLOW ASSEMBLY
PROPERTY LINE	UTILITY METER VAULT
SS — PROPOSED SEWER	FIRE DEPARTMENT CONNECTION (FDC)
SD — PROPOSED STORM DRAIN	PLANTER AREA/LANDSCAPE (REFER TO LANDSCAPING PLANS FOR DETAILS)
W — PROPOSED DOMESTIC WATER	BUILDING UNDER SEPARATE PERMIT
FW — PROPOSED FIRE WATER	PROPOSED BUILDING (REFER TO ARCHITECTURAL PLANS FOR DETAILS)
DEMOLITION LINE	BIOFILTRATION PLANTER/BIOSWALE
POINT OF CONNECTION	
COORDINATION POINT	
RETAINING WALL/SITE WALL	

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SCALE	AS SPECIFIED

KEY MAP

PROJECT DESCRIPTION

LA BREA TAR PITS DESIGN MASTER PLAN

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LOS ANGELES, CA 90036

DRAWING TITLE

ALTERNATIVE 4 LOW IMPACT DEVELOPMENT (LID) EXHIBIT

SHEET NUMBER (EXHIBIT NUMBER)

EXHB-05

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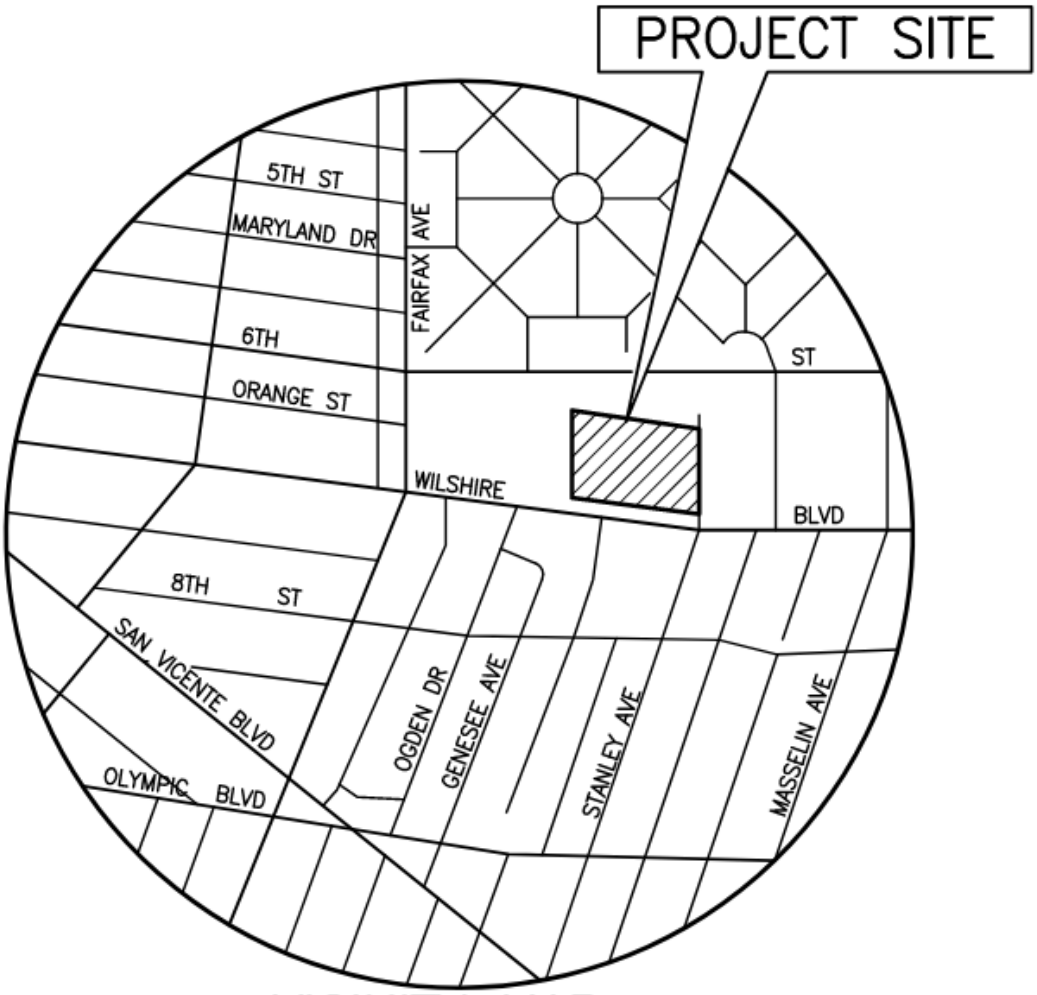
Appendices

Appendix A

Vicinity Map and Rainfall Depth



VICINITY MAP

NOT TO SCALE

THOMAS GUIDE **[LOS ANGELES]** EDITION

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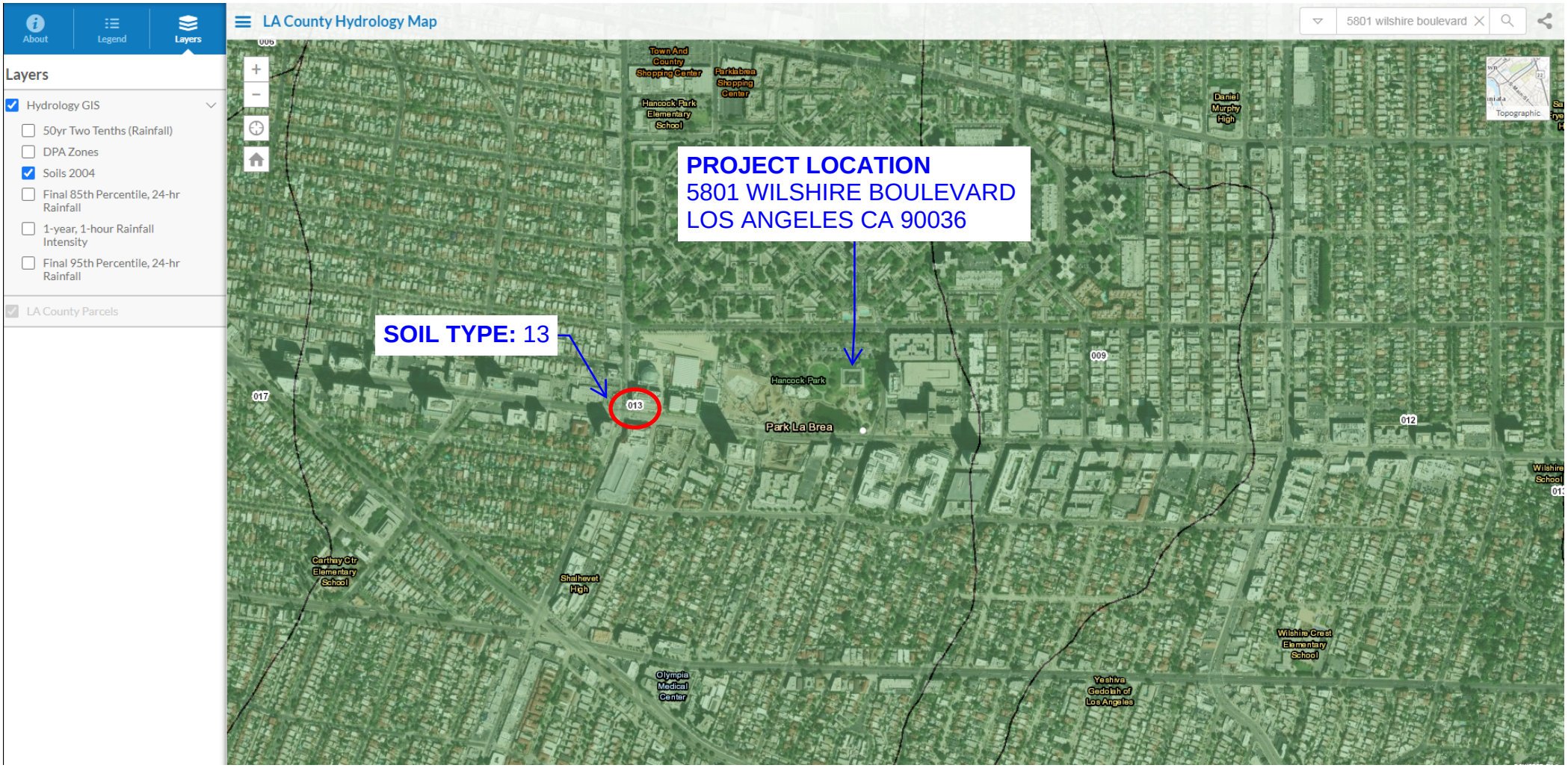
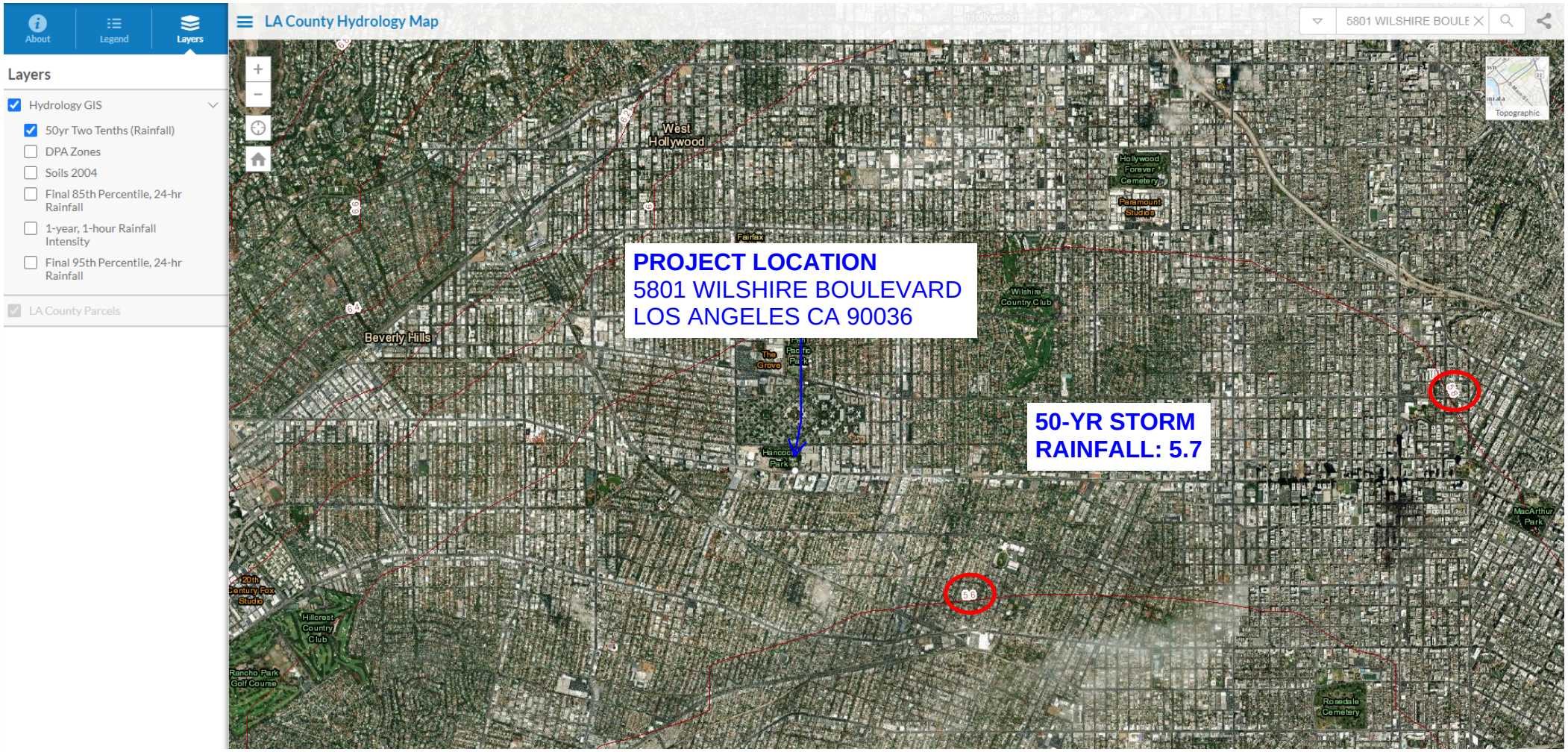

About
Legend
Layers
LA County Hydrology Map
5801 wilshire boulevard
Layers
Hydrology GIS
50yr Two Tenths (Rainfall)
DPA Zones
Soils 2004
Final 85th Percentile, 24-hr Rainfall
1-year, 1-hour Rainfall Intensity
Final 95th Percentile, 24-hr Rainfall
LA County Parcels
PROJECT LOCATION
5801 WILSHIRE BOULEVARD
LOS ANGELES CA 90036
SOIL TYPE: 13
013
017
009
012
Hancock Park
Park La Brea
Town And Country Shopping Center
Parklabrea Shopping Center
Hancock Park Elementary School
Daniel Murphy High
Carthay Ctr Elementary School
Shalhevet High
Olympia Medical Center
Yeshiva Gedolah of Los Angeles
Wilshire Crest Elementary School
Wilshire School
Topographic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LA County Hydrology Map
5801 WILSHIRE BOULE
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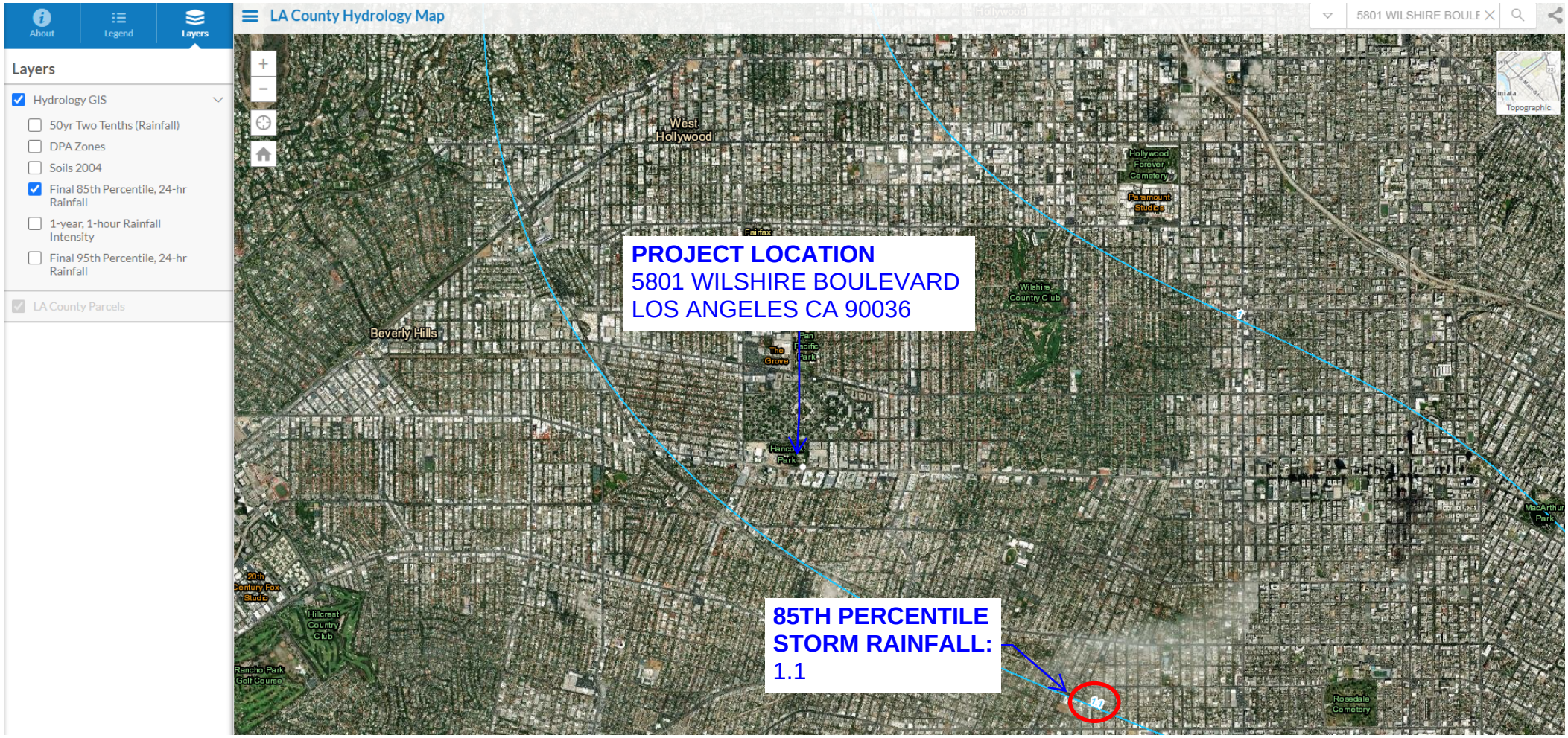
Hydrology GIS
50yr Two Tenths (Rainfall)
DPA Zones
Soils 2004
Final 85th Percentile, 24-hr Rainfall
1-year, 1-hour Rainfall Intensity
Final 95th Percentile, 24-hr Rainfall
LA County Parcels
PROJECT LOCATION
5801 WILSHIRE BOULEVARD
LOS ANGELES CA 90036
50-YR STORM
RAINFALL: 5.7
West Hollywood
Beverly Hills
Fairfax
Hollywood Forever Cemetery
Paramount Studios
Wilshire Country Club
The Grove
Hancock Park
MacArthur Park
Hillcrest Country Club
Rancho Park Golf Course
Rosedale Cemetery
Topographic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Layers
LA County Hydrology Map
5801 WILSHIRE BOULE
Layers
Hydrology GIS
50yr Two Tenths (Rainfall)
DPA Zones
Soils 2004
Final 85th Percentile, 24-hr Rainfall
1-year, 1-hour Rainfall Intensity
Final 95th Percentile, 24-hr Rainfall
LA County Parcels
West Hollywood
Beverly Hills
Hollywood Forever Cemetery
Paramount Studios
Wilshire Country Club
The Grove
Pan Pacific Park
Hancock Park
20th Century Fox Studio
Hillcrest Country Club
Rancho Park Golf Course
Rosedale Cemetery
MacArthur Park
Topographic
PROJECT LOCATION
5801 WILSHIRE BOULEVARD
LOS ANGELES CA 90036
85TH PERCENTILE
STORM RAINFALL:
1.1

Appendix B

LID Calculations

PROPOSED LID

Peak Flow Hydrologic Analysis

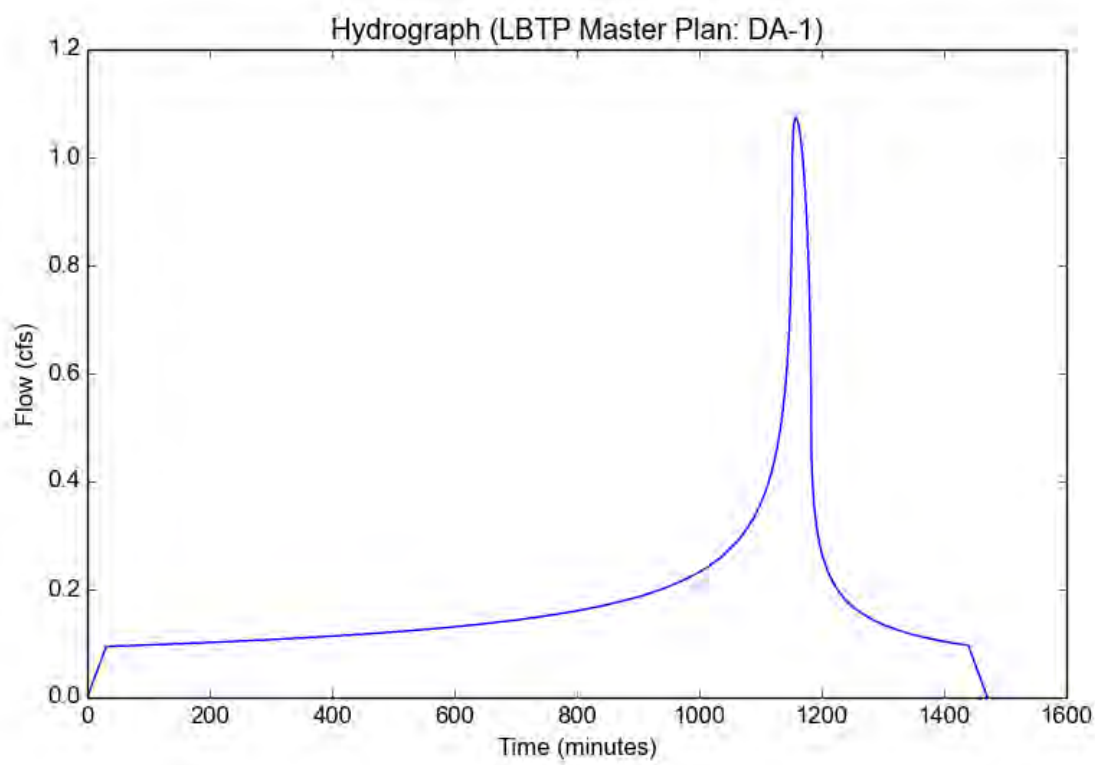
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan
Subarea ID	DA-1
Area (ac)	7.07
Flow Path Length (ft)	640.23
Flow Path Slope (vft/hft)	0.022757447
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.329561528
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.4176
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.3636
Time of Concentration (min)	31.0
Clear Peak Flow Rate (cfs)	1.0737
Burned Peak Flow Rate (cfs)	1.0737
24-Hr Clear Runoff Volume (ac-ft)	0.3506
24-Hr Clear Runoff Volume (cu-ft)	15271.9274



PROPOSED LID

Peak Flow Hydrologic Analysis

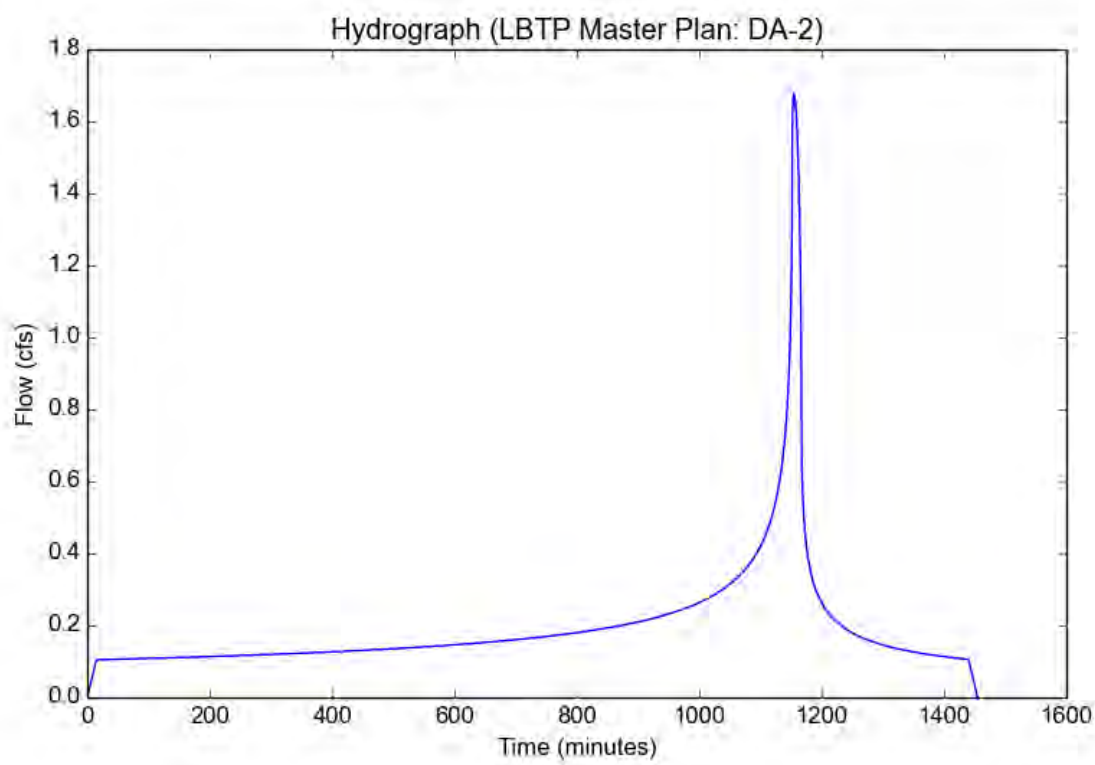
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan
Subarea ID	DA-2
Area (ac)	4.06
Flow Path Length (ft)	327.29
Flow Path Slope (vft/hft)	0.009716154
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.753694581
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.5874
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.703
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	1.6765
Burned Peak Flow Rate (cfs)	1.6765
24-Hr Clear Runoff Volume (ac-ft)	0.3892
24-Hr Clear Runoff Volume (cu-ft)	16952.8082



PROPOSED LID

Peak Flow Hydrologic Analysis

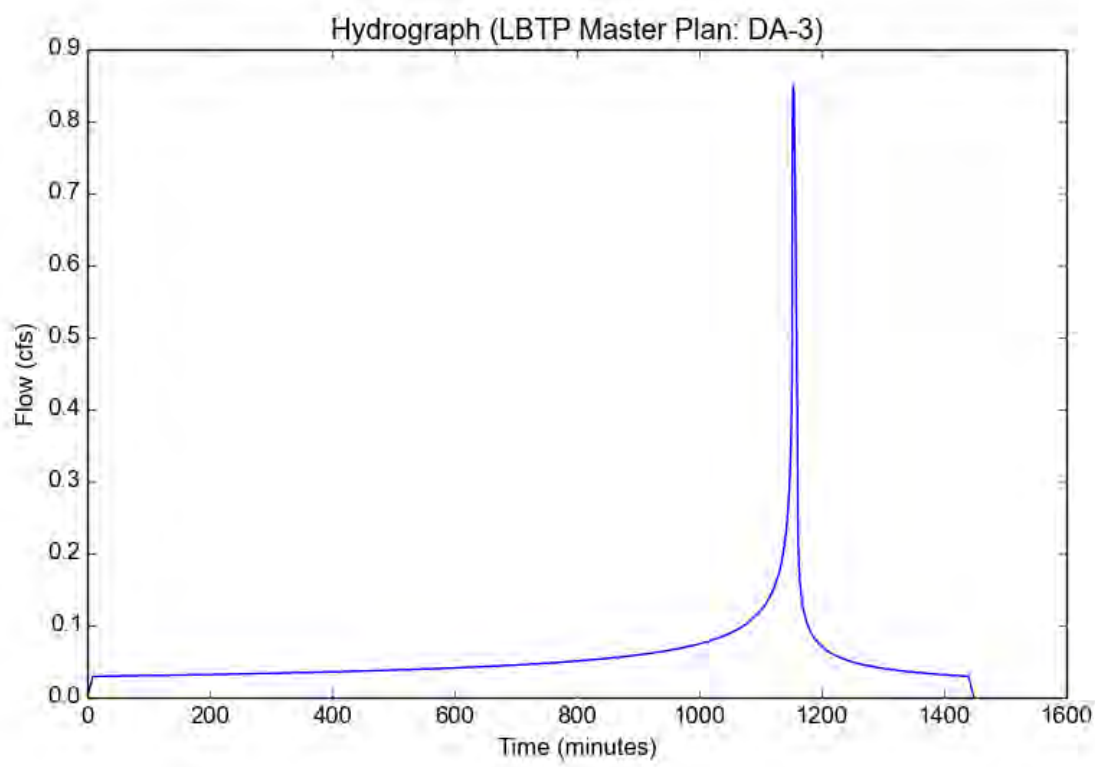
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan
Subarea ID	DA-3
Area (ac)	2.3
Flow Path Length (ft)	262.06
Flow Path Slope (vft/hft)	0.263
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.308695652
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.7468
Undeveloped Runoff Coefficient (Cu)	0.3129
Developed Runoff Coefficient (Cd)	0.4941
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	0.8487
Burned Peak Flow Rate (cfs)	0.8487
24-Hr Clear Runoff Volume (ac-ft)	0.1106
24-Hr Clear Runoff Volume (cu-ft)	4816.9533



PROPOSED LID

Peak Flow Hydrologic Analysis

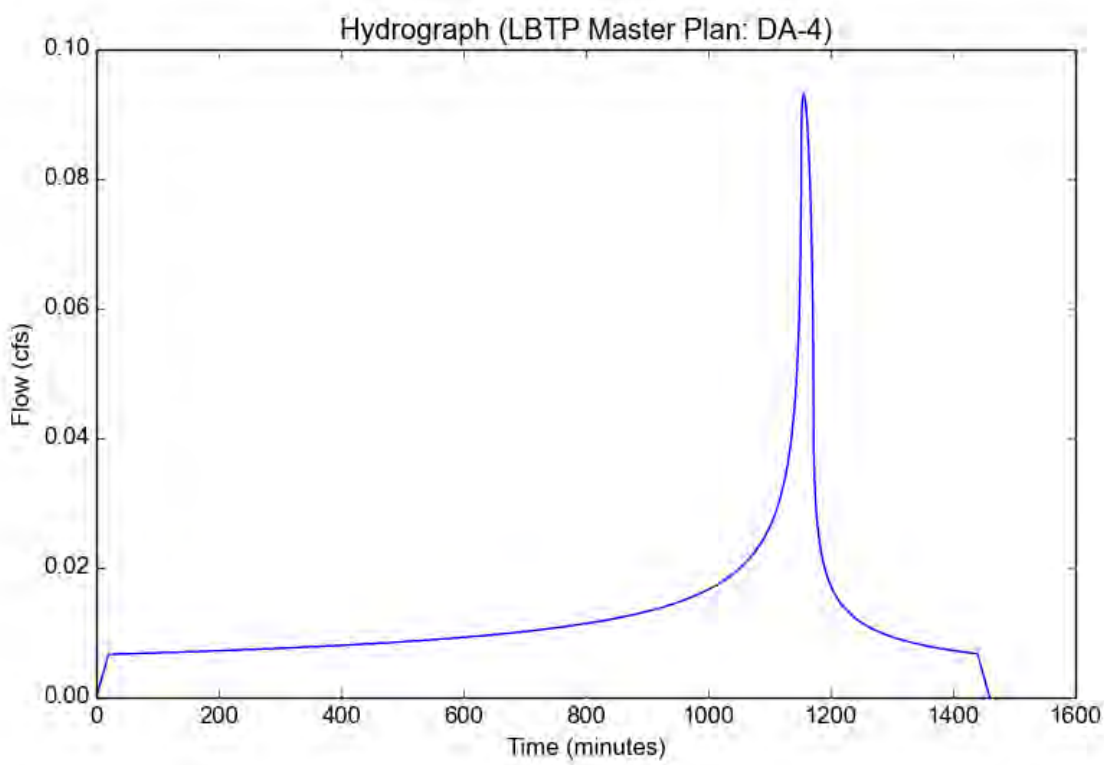
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan
Subarea ID	DA-4
Area (ac)	1.68
Flow Path Length (ft)	104.167
Flow Path Slope (vft/hft)	0.038399877
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.01
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.5131
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	0.0931
Burned Peak Flow Rate (cfs)	0.0931
24-Hr Clear Runoff Volume (ac-ft)	0.0247
24-Hr Clear Runoff Volume (cu-ft)	1077.7591



PROPOSED LID

Biofiltration Planter 1	DA-1		
[1]	85th Percentile Rainfall Depth (in)		1.10
[2]	Design Rainfall Depth (in)	[1] * 1.5	1.65
[3]	Clear Peak Flow Rate (cfs)	From Hydrocalc (Qpm)	1.07
[4]	24-Hr Clear Runoff Volume (cu-ft)	From Hydrocalc (=1.5 SWQDv)	15,272
[5]	$K_{sat,media}$ (in/hr)		5
[6]	FS		2
[7]	$K_{sat,design}$ (in/hr)	[5] / [6]	2.5
[8]	Proposed Planter Area (sf)		6,495
[9]	Proposed Planter Flow Rate (cfs)	[7]/12 in*[8]/60min*1/60sec	0.376
[10]	Proposed Total Storage Volume Required (cu-ft)	Use Hydrocalc CSV file to calculate area under hydrograph and above Planter Flow Rate	1,463
[11]	Proposed Additional Storage Volume Required (cu-ft)		0
[12]	d_{p_max}, Max. Ponding Depth (ft)		1
[13]	Proposed d_p, Calculated Ponding Depth (ft)	Use Hydrocalc CSV file to calculate peak depth. Roughly = [10]/[8]	0.23
[14]	Drawdown Time (hr)	[13]*12 in/ft /[7]	1.08
[15]	**A_{min} (sq. ft) (minimum area required)**	Iterate [8] until [13] = [12]	**4,038**

PROPOSED LID

Biofiltration Planter 2	DA-2		
[1]	85th Percentile Rainfall Depth (in)		1.10
[2]	Design Rainfall Depth (in)	[1] * 1.5	1.65
[3]	Clear Peak Flow Rate (cfs)	From Hydrocalc (Qpm)	1.68
[4]	24-Hr Clear Runoff Volume (cu-ft)	From Hydrocalc (=1.5 SWQDv)	16,953
[5]	$K_{sat,media}$ (in/hr)		5
[6]	FS		2
[7]	$K_{sat,design}$ (in/hr)	[5] / [6]	2.5
[8]	Proposed Planter Area (sf)		6,379
[9]	Proposed Planter Flow Rate (cfs)	[7]/12 in*[8]/60min*1/60sec	0.369
[10]	Proposed Total Storage Volume Required (cu-ft)	Use Hydrocalc CSV file to calculate area under hydrograph and above Planter Flow Rate	1,903
[11]	Proposed Additional Storage Volume Required (cu-ft)		0
[12]	d_{p_max}, Max. Ponding Depth (ft)		1
[13]	Proposed d_p, Calculated Ponding Depth (ft)	Use Hydrocalc CSV file to calculate peak depth. Roughly = [10]/[8]	0.30
[14]	Drawdown Time (hr)	[13]*12 in/ft /[7]	1.43
[15]	**A_{min} (sq. ft) (minimum area required)**	Iterate [8] until [13] = [12]	**3,619**

PROPOSED LID

Biofiltration Planter 3	DA-3		
[1]	85th Percentile Rainfall Depth (in)		1.10
[2]	Design Rainfall Depth (in)	[1] * 1.5	1.65
[3]	Clear Peak Flow Rate (cfs)	From Hydrocalc (Qpm)	0.85
[4]	24-Hr Clear Runoff Volume (cu-ft)	From Hydrocalc (=1.5 SWQDv)	4,817
[5]	$K_{sat,media}$ (in/hr)		5
[6]	FS		2
[7]	$K_{sat,design}$ (in/hr)	[5] /[6]	2.5
[8]	Proposed Planter Area (sf)		10,130
[9]	Proposed Planter Flow Rate (cfs)	[7]/12 in*[8]/60min*1/60sec	0.586
[10]	Proposed Total Storage Volume Required (cu-ft)	Use Hydrocalc CSV file to calculate area under hydrograph and above Planter Flow Rate	69
[11]	Proposed Additional Storage Volume Required (cu-ft)		0
[12]	d_{p_max}, Max. Ponding Depth (ft)		1
[13]	Proposed d_p, Calculated Ponding Depth (ft)	Use Hydrocalc CSV file to calculate peak depth. Roughly = [10]/[8]	0.01
[14]	Drawdown Time (hr)	[13]*12 in/ft /[7]	0.03
[15]	**A_{min} (sq. ft) (minimum area required)**	Iterate [8] until [13] = [12]	**1,048**

Appendix C

Alternate 4 LID Calculations

ALTERNATE 4 LID

Peak Flow Hydrologic Analysis

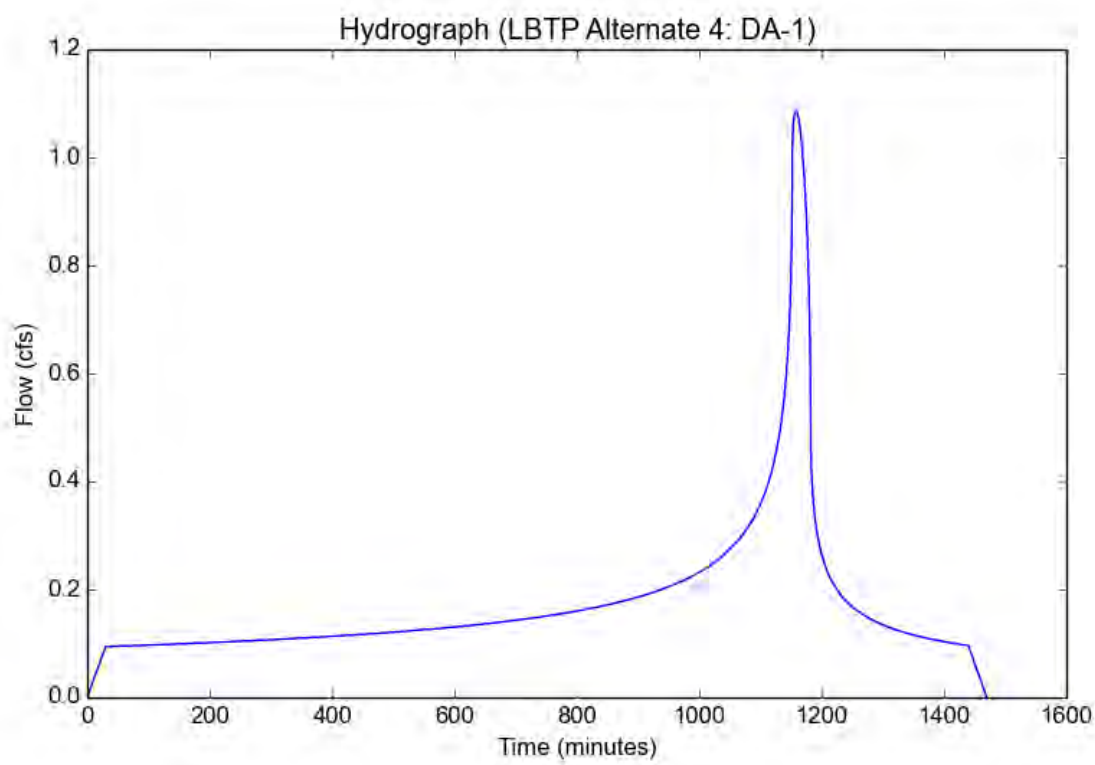
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4
Subarea ID	DA-1
Area (ac)	6.75
Flow Path Length (ft)	640.23
Flow Path Slope (vft/hft)	0.022757447
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.34962963
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.4241
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.3797
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1.0869
Burned Peak Flow Rate (cfs)	1.0869
24-Hr Clear Runoff Volume (ac-ft)	0.3495
24-Hr Clear Runoff Volume (cu-ft)	15224.3948



ALTERNATE 4 LID

Peak Flow Hydrologic Analysis

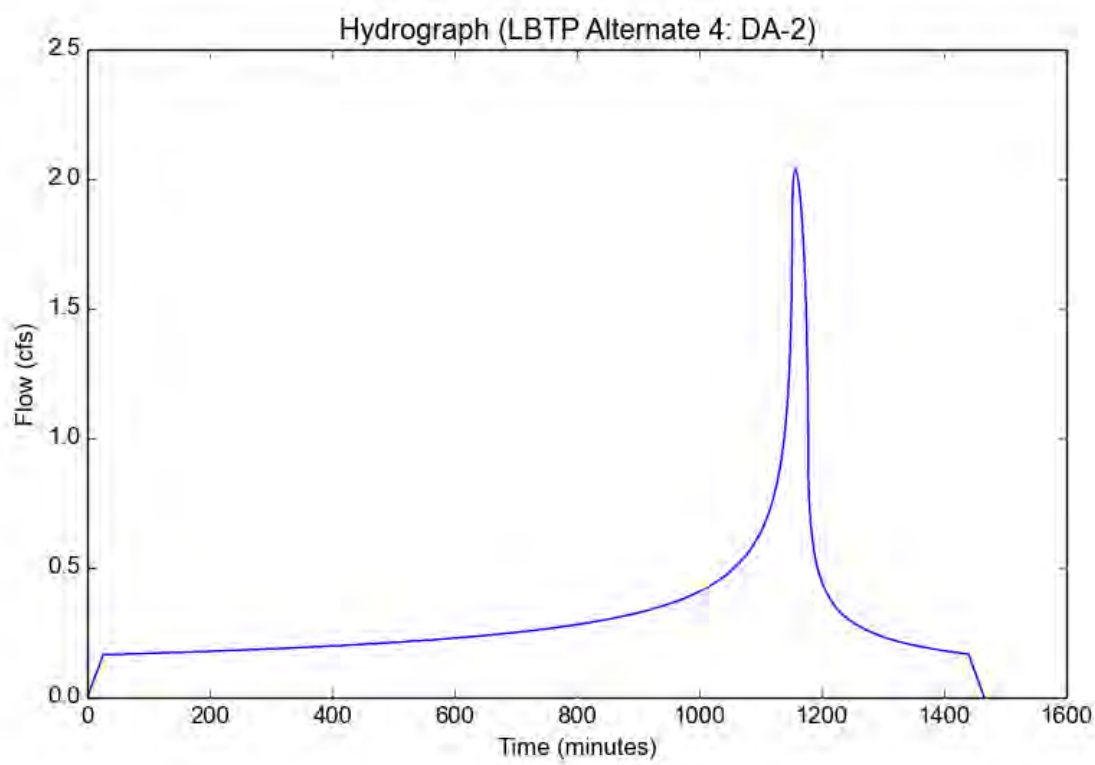
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4
Subarea ID	DA-2
Area (ac)	6.01
Flow Path Length (ft)	760.81
Flow Path Slope (vft/hft)	0.007452583
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.808652246
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.4536
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.7469
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	2.0362
Burned Peak Flow Rate (cfs)	2.0362
24-Hr Clear Runoff Volume (ac-ft)	0.6121
24-Hr Clear Runoff Volume (cu-ft)	26664.8893



ALTERNATE 4 LID

Peak Flow Hydrologic Analysis

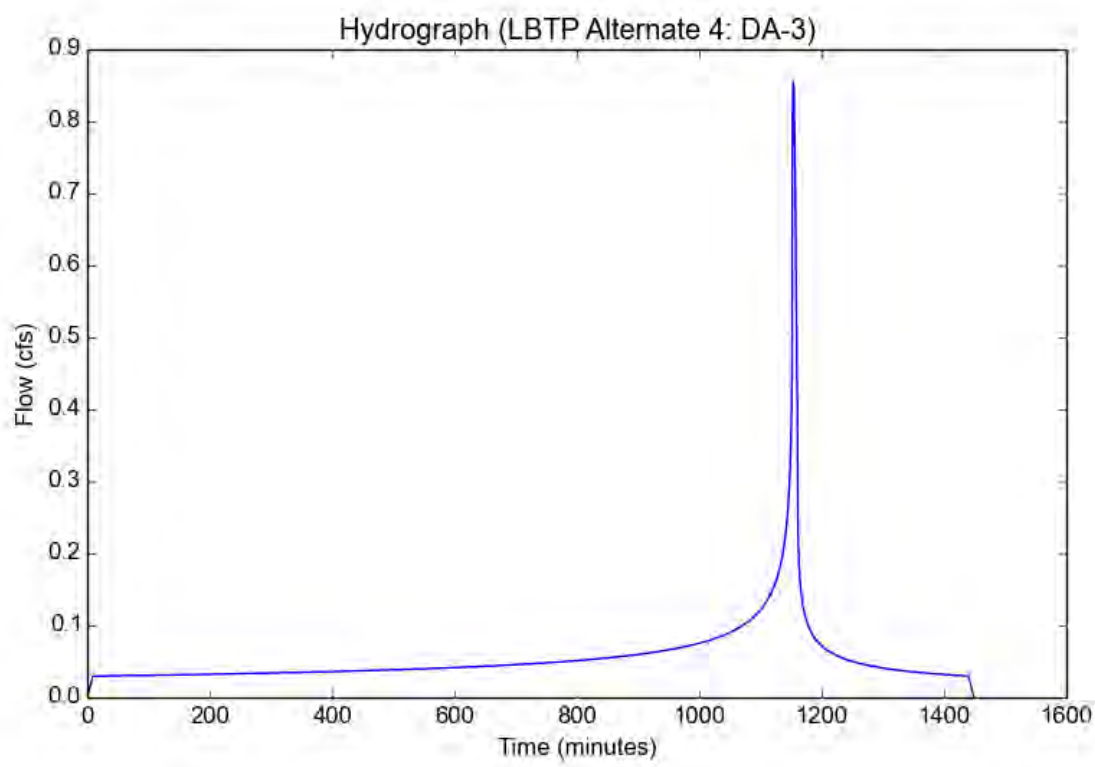
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4
Subarea ID	DA-3
Area (ac)	2.31
Flow Path Length (ft)	262.06
Flow Path Slope (vft/hft)	0.263
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.311688312
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.7468
Undeveloped Runoff Coefficient (Cu)	0.3129
Developed Runoff Coefficient (Cd)	0.4959
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	0.8555
Burned Peak Flow Rate (cfs)	0.8555
24-Hr Clear Runoff Volume (ac-ft)	0.1118
24-Hr Clear Runoff Volume (cu-ft)	4870.4134



ALTERNATE 4 LID

Peak Flow Hydrologic Analysis

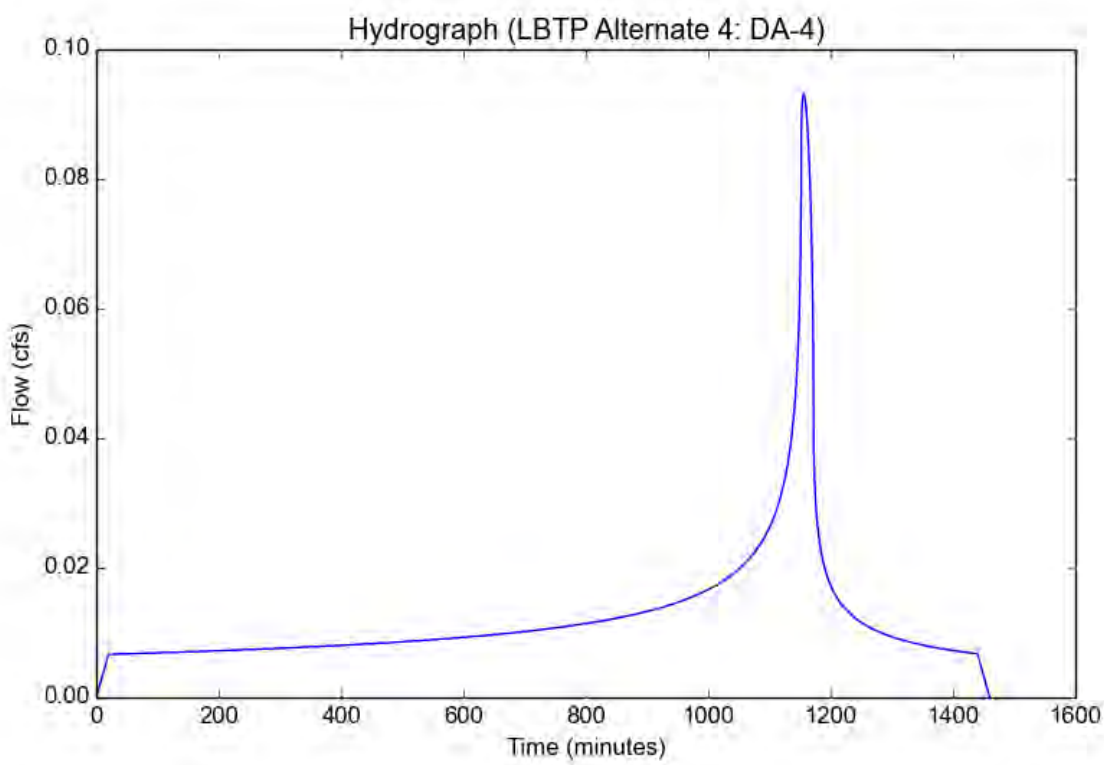
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4
Subarea ID	DA-4
Area (ac)	1.68
Flow Path Length (ft)	104.167
Flow Path Slope (vft/hft)	0.038399877
85th Percentile Rainfall Depth (in)	1.65
Percent Impervious	0.01
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.65
Peak Intensity (in/hr)	0.5131
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	0.0931
Burned Peak Flow Rate (cfs)	0.0931
24-Hr Clear Runoff Volume (ac-ft)	0.0247
24-Hr Clear Runoff Volume (cu-ft)	1077.7591



ALTERNATE 4 LID

Biofiltration Planter 1	DA-1		
[1]	85th Percentile Rainfall Depth (in)		1.10
[2]	Design Rainfall Depth (in)	[1] * 1.5	1.65
[3]	Clear Peak Flow Rate (cfs)	From Hydrocalc (Qpm)	1.09
[4]	24-Hr Clear Runoff Volume (cu-ft)	From Hydrocalc (=1.5 SWQDv)	15,224
[5]	$K_{sat,media}$ (in/hr)		5
[6]	FS		2
[7]	$K_{sat,design}$ (in/hr)	[5] / [6]	2.5
[8]	Proposed Planter Area (sf)		6,495
[9]	Proposed Planter Flow Rate (cfs)	[7]/12 in*[8]/60min*1/60sec	0.376
[10]	Proposed Total Storage Volume Required (cu-ft)	Use Hydrocalc CSV file to calculate area under hydrograph and above Planter Flow Rate	1,455
[11]	Proposed Additional Storage Volume Required (cu-ft)		0
[12]	d_{p_max}, Max. Ponding Depth (ft)		1
[13]	Proposed d_p, Calculated Ponding Depth (ft)	Use Hydrocalc CSV file to calculate peak depth. Roughly = [10]/[8]	0.22
[14]	Drawdown Time (hr)	[13]*12 in/ft /[7]	1.08
[15]	**A_{min} (sq. ft) (minimum area required)**	Iterate [8] until [13] = [12]	**3,248**

ALTERNATE 4 LID

Biofiltration Planter 2	DA-2		
[1]	85th Percentile Rainfall Depth (in)		1.10
[2]	Design Rainfall Depth (in)	[1] * 1.5	1.65
[3]	Clear Peak Flow Rate (cfs)	From Hydrocalc (Qpm)	2.04
[4]	24-Hr Clear Runoff Volume (cu-ft)	From Hydrocalc (=1.5 SWQDv)	26,665
[5]	$K_{sat,media}$ (in/hr)		5
[6]	FS		2
[7]	$K_{sat,design}$ (in/hr)	[5] / [6]	2.5
[8]	Proposed Planter Area (sf)		6,580
[9]	Proposed Planter Flow Rate (cfs)	[7]/12 in*[8]/60min*1/60sec	0.381
[10]	Proposed Total Storage Volume Required (cu-ft)	Use Hydrocalc CSV file to calculate area under hydrograph and above Planter Flow Rate	4,825
[11]	Proposed Additional Storage Volume Required (cu-ft)		0
[12]	d_{p_max}, Max. Ponding Depth (ft)		1
[13]	Proposed d_p, Calculated Ponding Depth (ft)	Use Hydrocalc CSV file to calculate peak depth. Roughly = [10]/[8]	0.73
[14]	Drawdown Time (hr)	[13]*12 in/ft /[7]	3.52
[15]	**A_{min} (sq. ft) (minimum area required)**	Iterate [8] until [13] = [12]	**5,689**

ALTERNATE 4 LID

Biofiltration Planter 3	DA-3		
[1]	85th Percentile Rainfall Depth (in)		1.10
[2]	Design Rainfall Depth (in)	[1] * 1.5	1.65
[3]	Clear Peak Flow Rate (cfs)	From Hydrocalc (Qpm)	0.86
[4]	24-Hr Clear Runoff Volume (cu-ft)	From Hydrocalc (=1.5 SWQDv)	4,870
[5]	$K_{sat,media}$ (in/hr)		5
[6]	FS		2
[7]	$K_{sat,design}$ (in/hr)	[5] /[6]	2.5
[8]	Proposed Planter Area (sf)		10,130
[9]	Proposed Planter Flow Rate (cfs)	[7]/12 in*[8]/60min*1/60sec	0.586
[10]	Proposed Total Storage Volume Required (cu-ft)	Use Hydrocalc CSV file to calculate area under hydrograph and above Planter Flow Rate	72
[11]	Proposed Additional Storage Volume Required (cu-ft)		0
[12]	d_{p_max}, Max. Ponding Depth (ft)		1
[13]	Proposed d_p, Calculated Ponding Depth (ft)	Use Hydrocalc CSV file to calculate peak depth. Roughly = [10]/[8]	0.01
[14]	Drawdown Time (hr)	[13]*12 in/ft /[7]	0.03
[15]	**A_{min} (sq. ft) (minimum area required)**	Iterate [8] until [13] = [12]	**1,060**

Appendix D

Existing Hydrology Calculations

EXISTING HYDROLOGY

Peak Flow Hydrologic Analysis

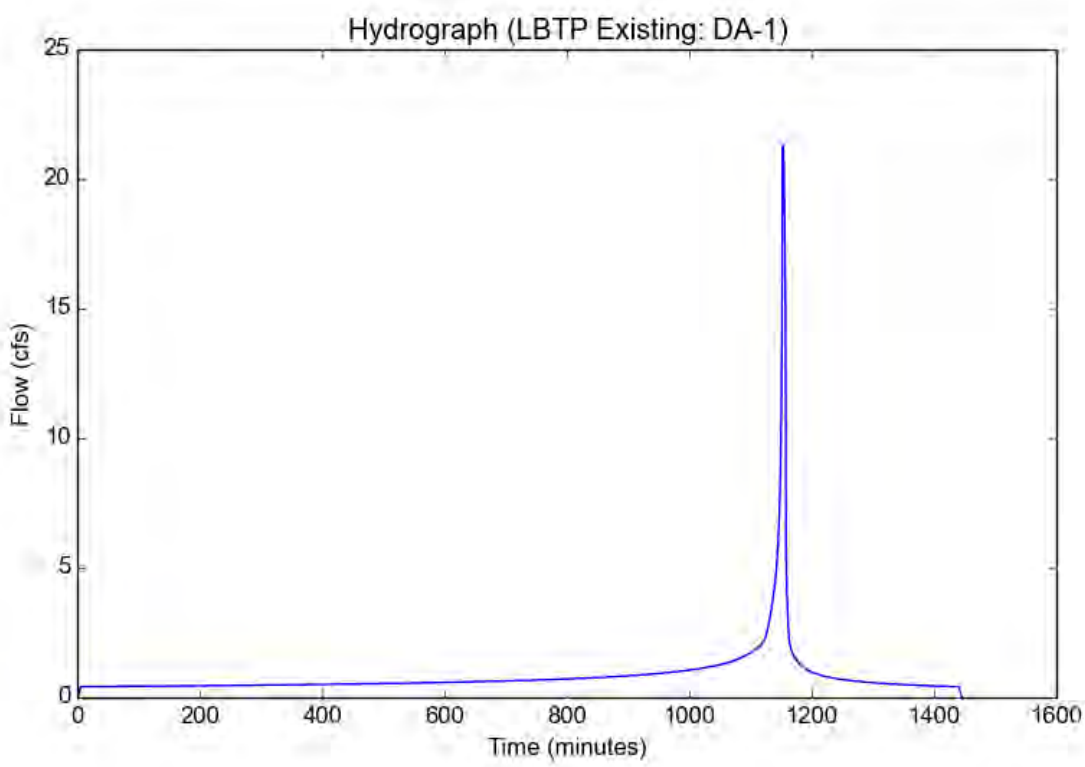
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Existing/Hydrocalc/Hydrocalc Output_LBTP Existing Report.p
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Existing
Subarea ID	DA-1
Area (ac)	8.59
Flow Path Length (ft)	531.1
Flow Path Slope (vft/hft)	0.039389945
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.41443539
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.7407
Undeveloped Runoff Coefficient (Cu)	0.9082
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	21.1882
Burned Peak Flow Rate (cfs)	21.1882
24-Hr Clear Runoff Volume (ac-ft)	1.6778
24-Hr Clear Runoff Volume (cu-ft)	73086.5755



EXISTING HYDROLOGY

Peak Flow Hydrologic Analysis

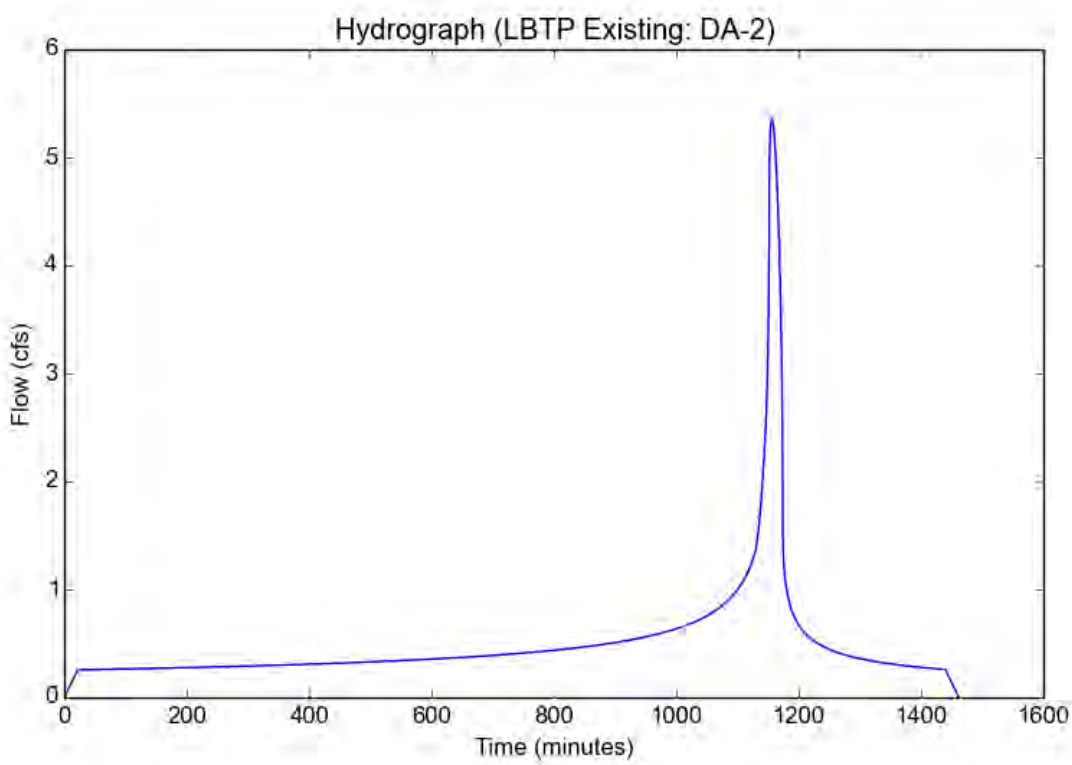
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Existing/Hydrocalc/Hydrocalc Output_LBTP Existing Report.p
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Existing
Subarea ID	DA-2
Area (ac)	4.51
Flow Path Length (ft)	2002.9167
Flow Path Slope (vft/hft)	0.00679509
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.509977827
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	1.4882
Undeveloped Runoff Coefficient (Cu)	0.6924
Developed Runoff Coefficient (Cd)	0.7983
Time of Concentration (min)	22.0
Clear Peak Flow Rate (cfs)	5.3578
Burned Peak Flow Rate (cfs)	5.3578
24-Hr Clear Runoff Volume (ac-ft)	1.0061
24-Hr Clear Runoff Volume (cu-ft)	43826.3335



EXISTING HYDROLOGY

Peak Flow Hydrologic Analysis

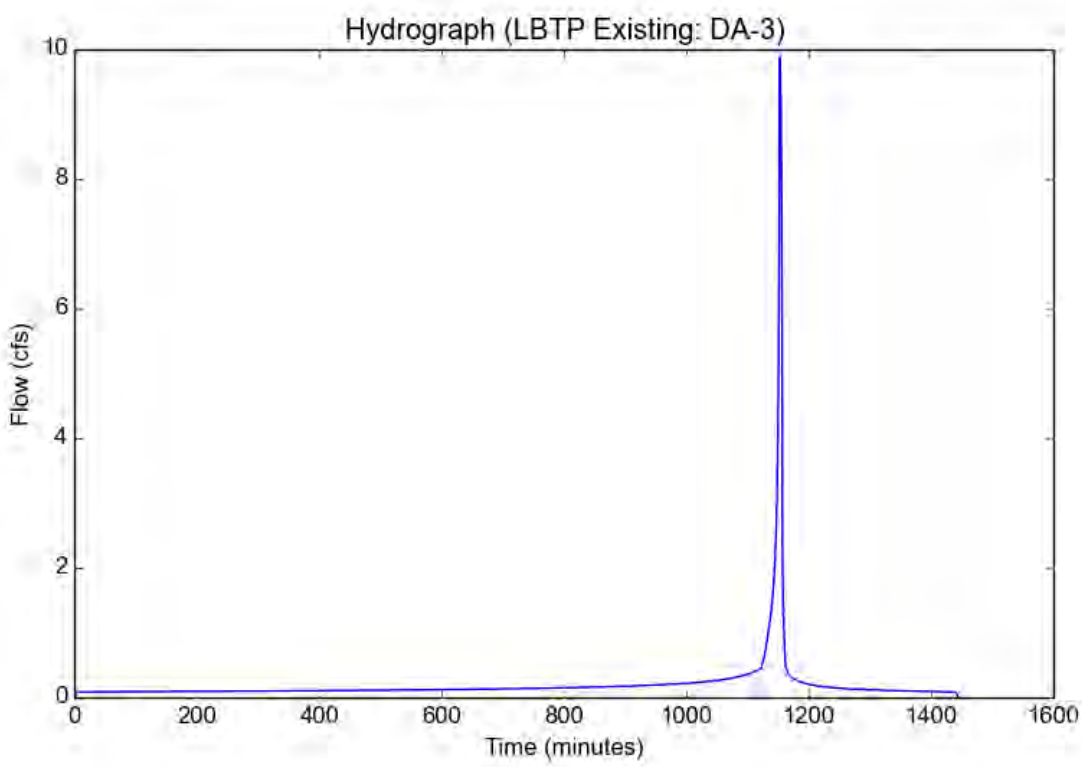
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Existing/Hydrocalc/Hydrocalc Output_LBTP Existing Report.p
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Existing
Subarea ID	DA-3
Area (ac)	3.59
Flow Path Length (ft)	291.167
Flow Path Slope (vft/hft)	0.065254648
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.142061281
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.9859
Undeveloped Runoff Coefficient (Cu)	0.9258
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	9.6474
Burned Peak Flow Rate (cfs)	9.6474
24-Hr Clear Runoff Volume (ac-ft)	0.4057
24-Hr Clear Runoff Volume (cu-ft)	17673.4429



EXISTING HYDROLOGY

Peak Flow Hydrologic Analysis

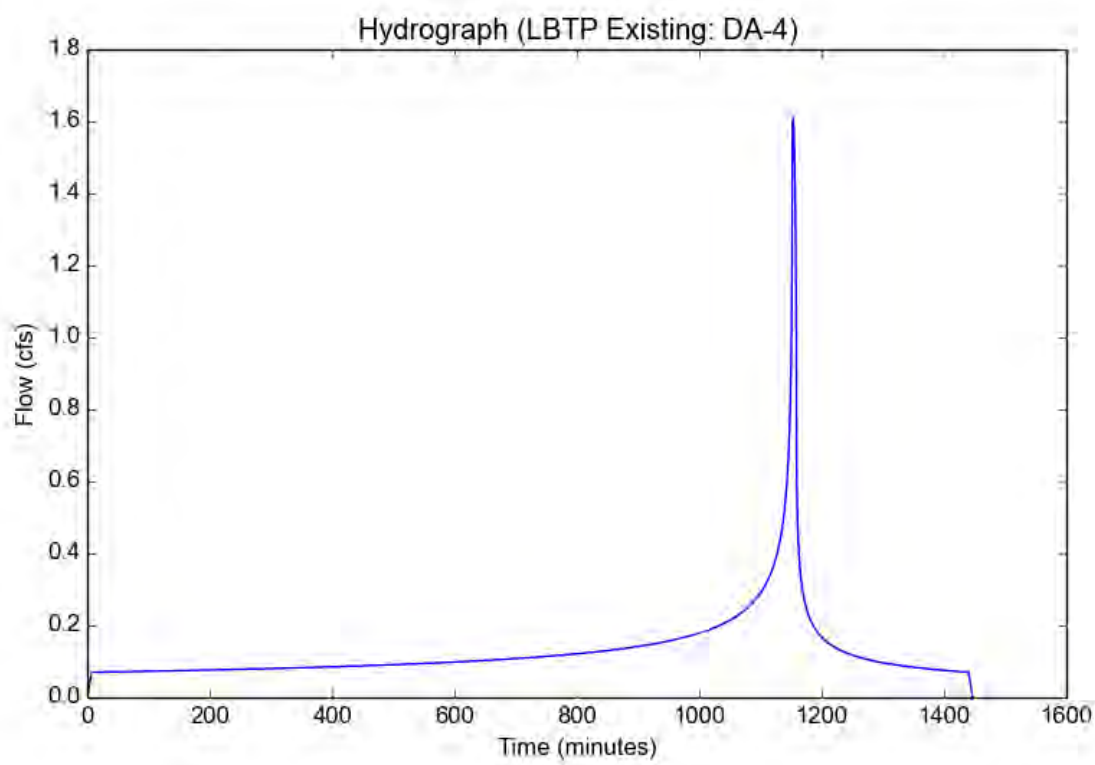
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Existing/Hydrocalc/Hydrocalc Output_LBTP Existing Report.p
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Existing
Subarea ID	DA-4
Area (ac)	0.7
Flow Path Length (ft)	526.14
Flow Path Slope (vft/hft)	0.014463831
50-yr Rainfall Depth (in)	5.7
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.5491
Undeveloped Runoff Coefficient (Cu)	0.8944
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	1.606
Burned Peak Flow Rate (cfs)	1.606
24-Hr Clear Runoff Volume (ac-ft)	0.2606
24-Hr Clear Runoff Volume (cu-ft)	11350.4398



Appendix E

Proposed Hydrology Calculations

PROPOSED HYDROLOGY

Peak Flow Hydrologic Analysis

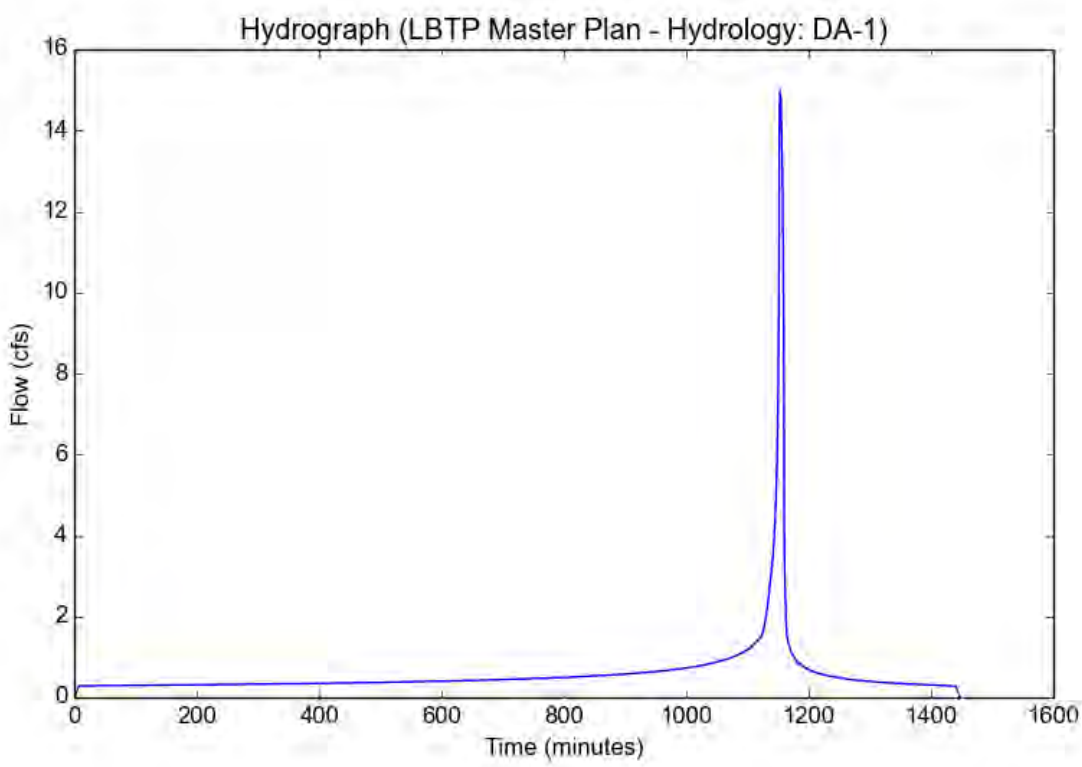
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan - Hydrology
Subarea ID	DA-1
Area (ac)	7.07
Flow Path Length (ft)	640.23
Flow Path Slope (vft/hft)	0.022757447
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.329561528
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.3941
Undeveloped Runoff Coefficient (Cu)	0.877
Developed Runoff Coefficient (Cd)	0.8846
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	14.9724
Burned Peak Flow Rate (cfs)	14.9724
24-Hr Clear Runoff Volume (ac-ft)	1.1993
24-Hr Clear Runoff Volume (cu-ft)	52243.5266



PROPOSED HYDROLOGY

Peak Flow Hydrologic Analysis

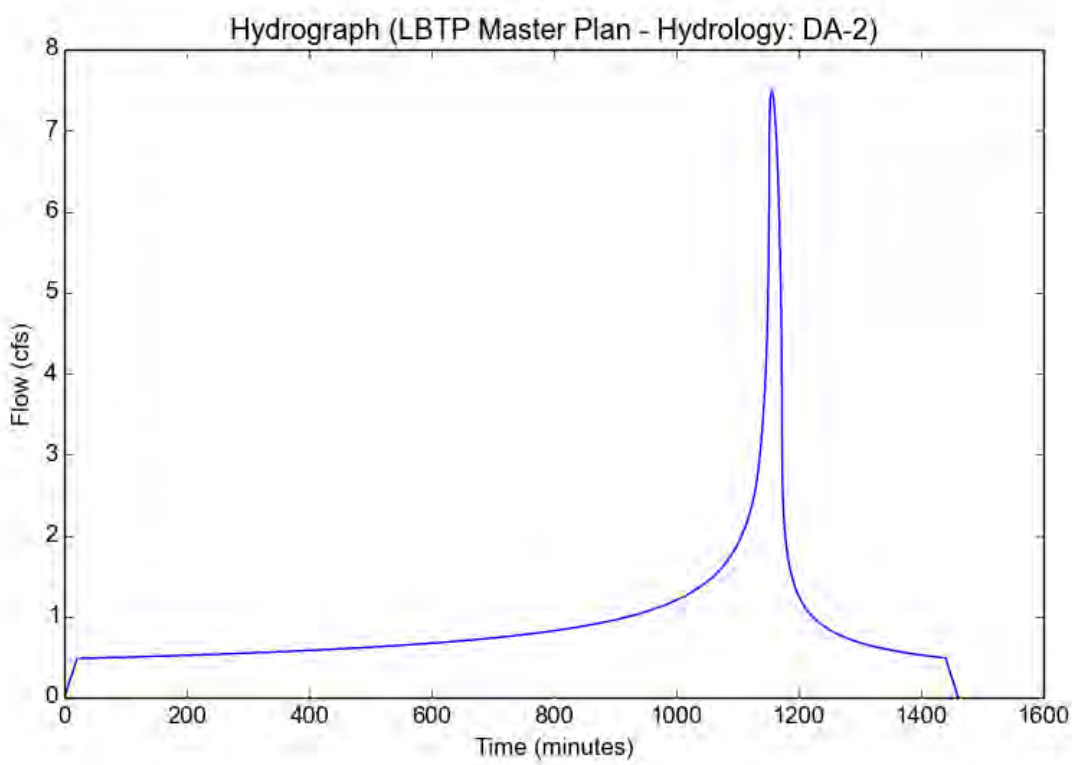
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan - Hydrology
Subarea ID	DA-2
Area (ac)	5.69
Flow Path Length (ft)	2012.46
Flow Path Slope (vft/hft)	0.006762867
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.824253076
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	1.5211
Undeveloped Runoff Coefficient (Cu)	0.7034
Developed Runoff Coefficient (Cd)	0.8654
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	7.4902
Burned Peak Flow Rate (cfs)	7.4902
24-Hr Clear Runoff Volume (ac-ft)	1.8139
24-Hr Clear Runoff Volume (cu-ft)	79014.93



PROPOSED HYDROLOGY

Peak Flow Hydrologic Analysis

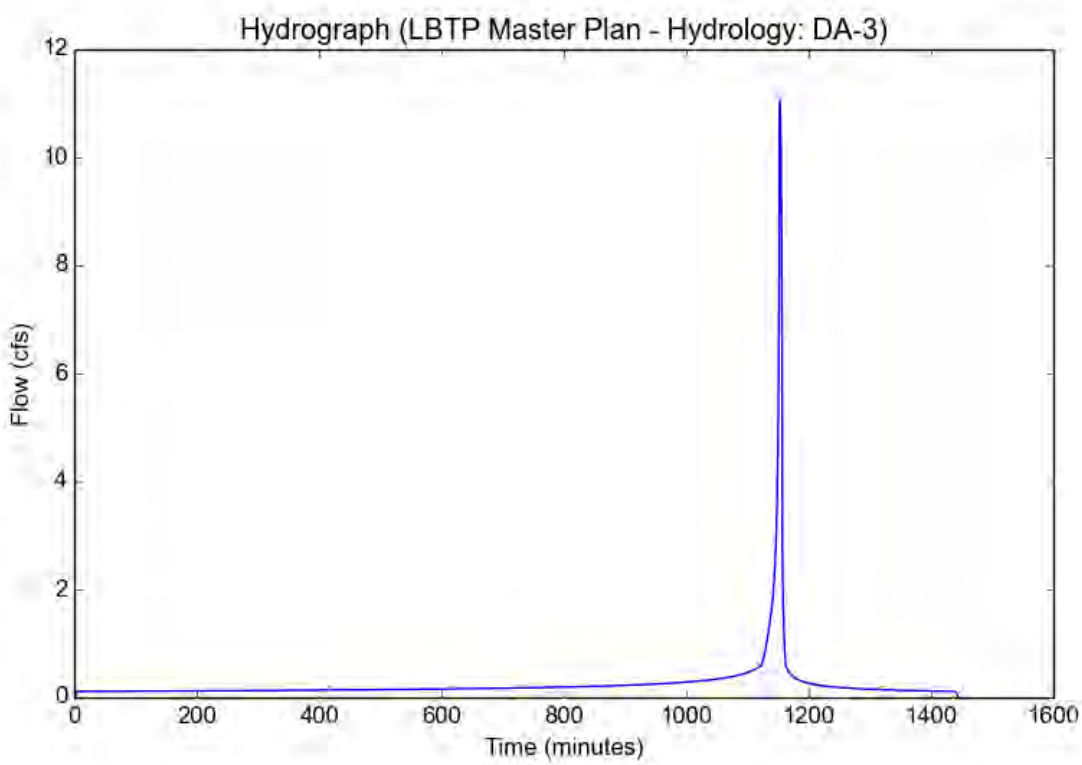
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan - Hydrology
Subarea ID	DA-3
Area (ac)	4.01
Flow Path Length (ft)	360.69
Flow Path Slope (vft/hft)	0.263
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.184538653
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.9859
Undeveloped Runoff Coefficient (Cu)	0.9258
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	10.776
Burned Peak Flow Rate (cfs)	10.776
24-Hr Clear Runoff Volume (ac-ft)	0.5047
24-Hr Clear Runoff Volume (cu-ft)	21982.9789



PROPOSED HYDROLOGY

Peak Flow Hydrologic Analysis

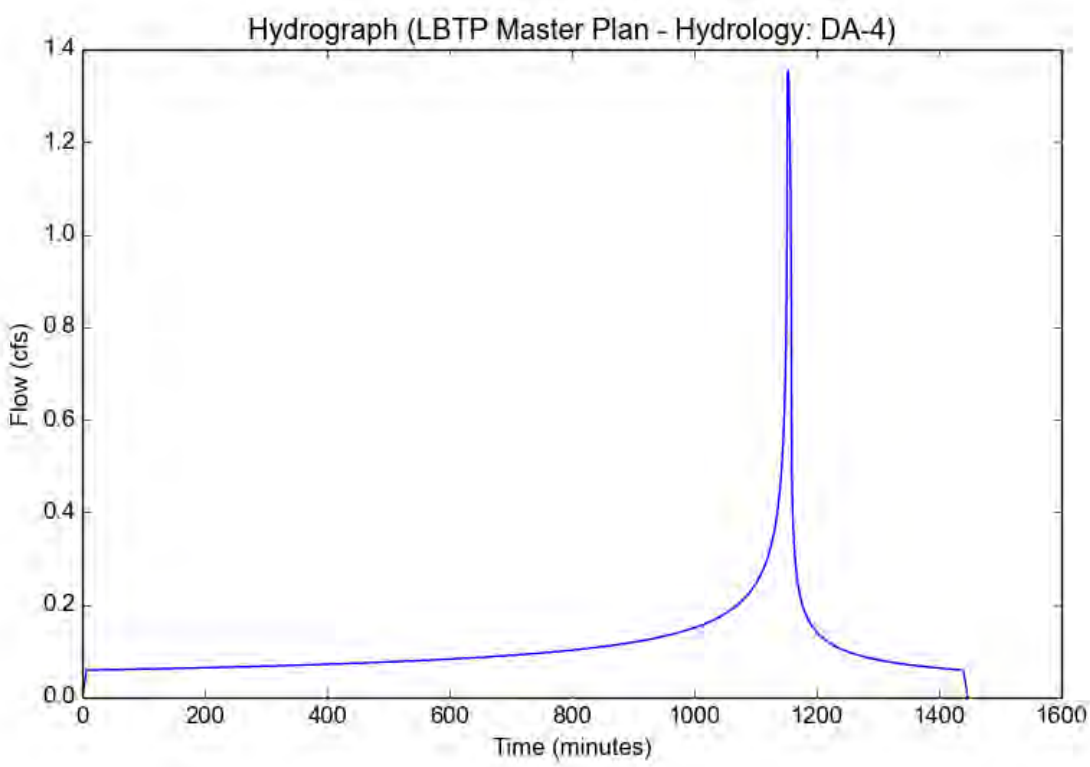
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Master Plan/Hydrocalc/Hydrocalc Output LBTP M
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Master Plan - Hydrology
Subarea ID	DA-4
Area (ac)	0.59
Flow Path Length (ft)	487.33
Flow Path Slope (vft/hft)	0.013194345
50-yr Rainfall Depth (in)	5.7
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.5491
Undeveloped Runoff Coefficient (Cu)	0.8944
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	1.3536
Burned Peak Flow Rate (cfs)	1.3536
24-Hr Clear Runoff Volume (ac-ft)	0.2196
24-Hr Clear Runoff Volume (cu-ft)	9566.7992



Appendix F

Alternate 4 Proposed Hydrology Calculations

ALTERNATE 4 HYDROLOGY

Peak Flow Hydrologic Analysis

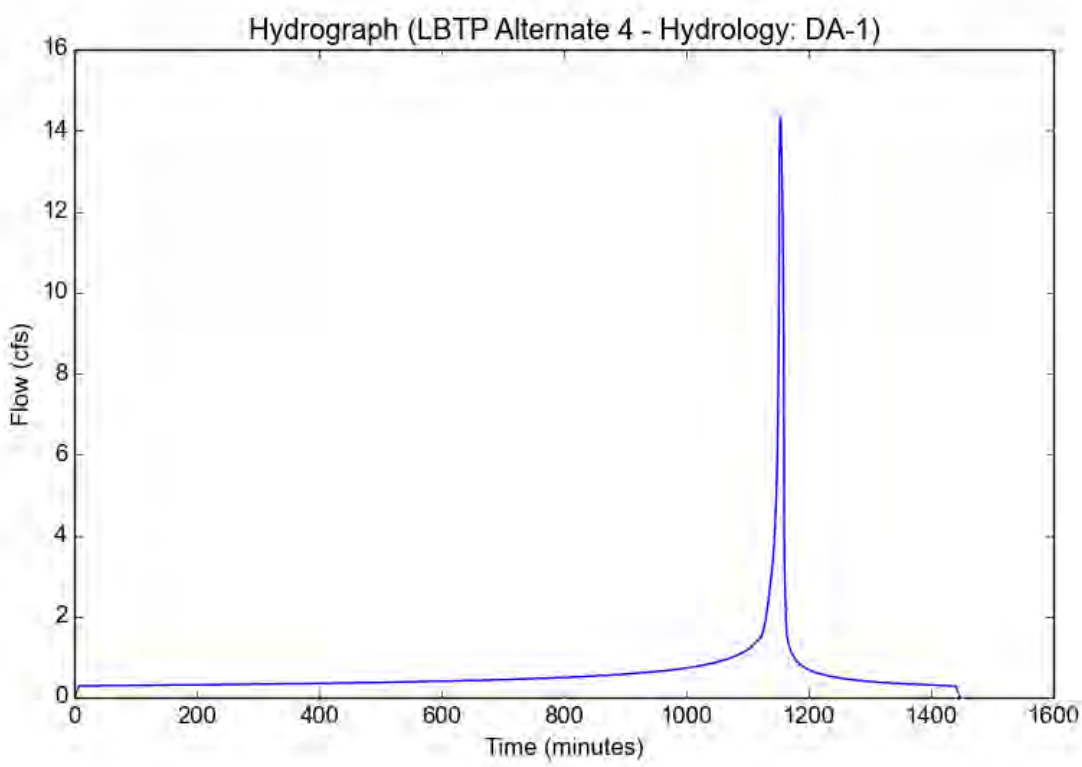
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4 - Hydrology
Subarea ID	DA-1
Area (ac)	6.75
Flow Path Length (ft)	640.23
Flow Path Slope (vft/hft)	0.022757447
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.34962963
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.3941
Undeveloped Runoff Coefficient (Cu)	0.877
Developed Runoff Coefficient (Cd)	0.885
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	14.3022
Burned Peak Flow Rate (cfs)	14.3022
24-Hr Clear Runoff Volume (ac-ft)	1.186
24-Hr Clear Runoff Volume (cu-ft)	51662.0481



ALTERNATE 4 HYDROLOGY

Peak Flow Hydrologic Analysis

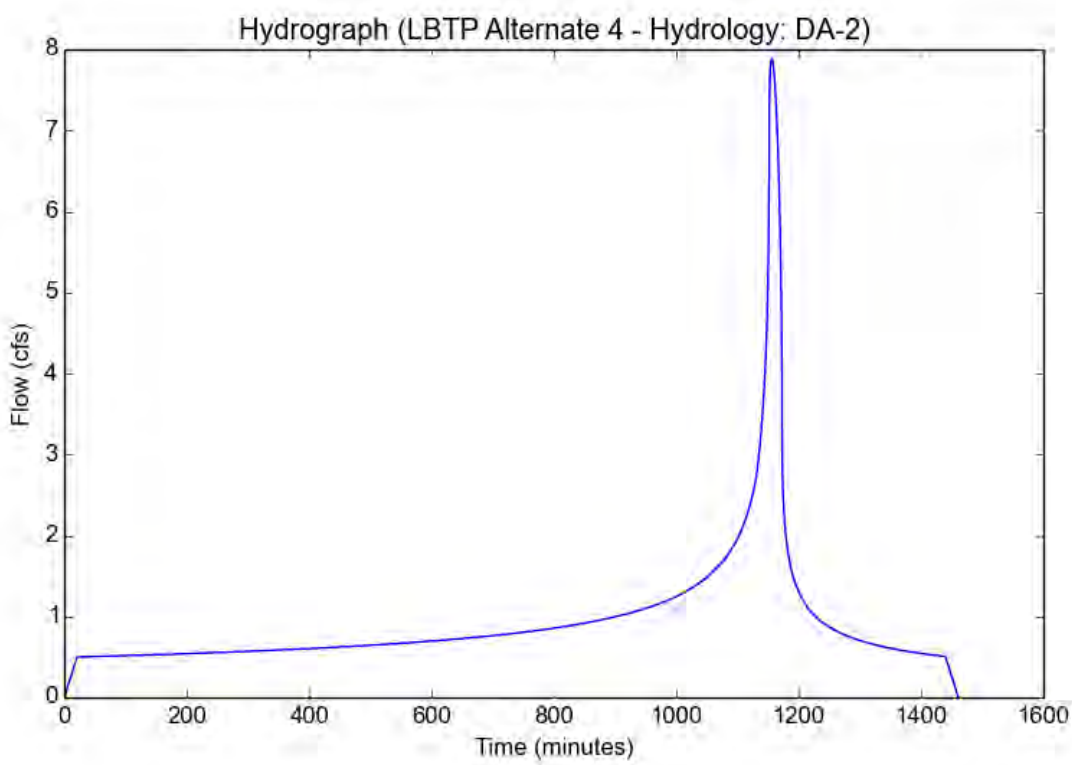
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4 - Hydrology
Subarea ID	DA-2
Area (ac)	6.01
Flow Path Length (ft)	2012.46
Flow Path Slope (vft/hft)	0.006762867
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.808652246
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	1.5211
Undeveloped Runoff Coefficient (Cu)	0.7034
Developed Runoff Coefficient (Cd)	0.8624
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	7.8834
Burned Peak Flow Rate (cfs)	7.8834
24-Hr Clear Runoff Volume (ac-ft)	1.8874
24-Hr Clear Runoff Volume (cu-ft)	82216.4698



ALTERNATE 4 HYDROLOGY

Peak Flow Hydrologic Analysis

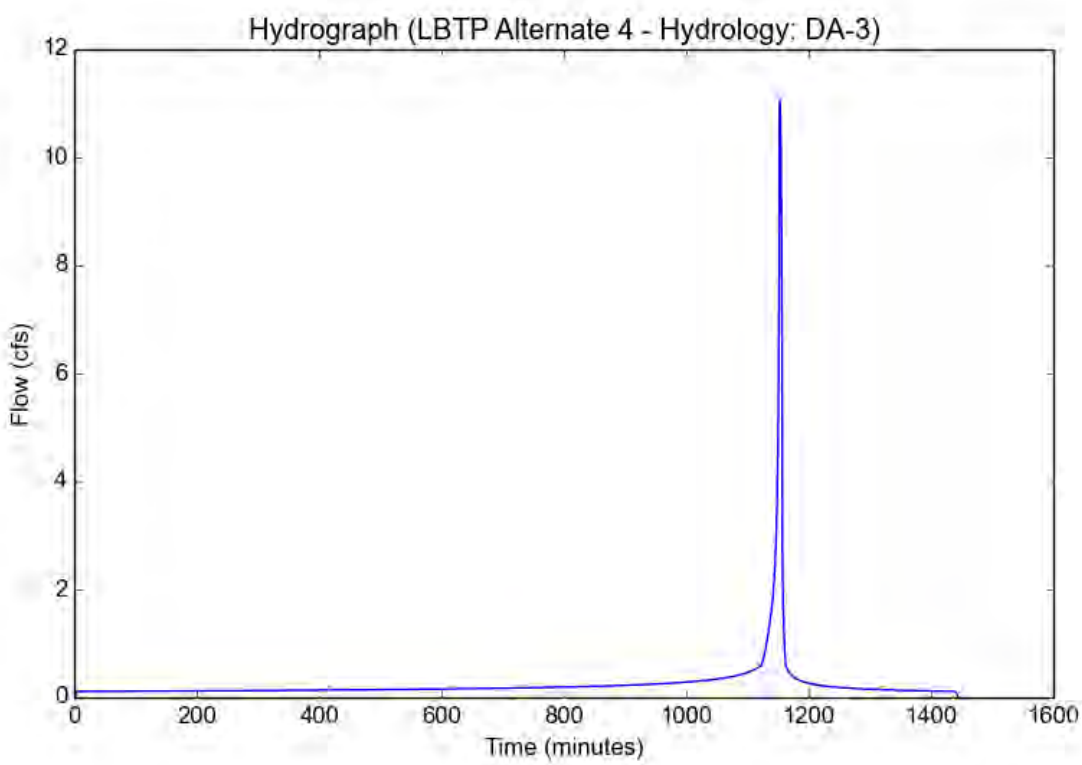
File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4 - Hydrology
Subarea ID	DA-3
Area (ac)	4.01
Flow Path Length (ft)	360.69
Flow Path Slope (vft/hft)	0.263
50-yr Rainfall Depth (in)	5.7
Percent Impervious	0.184538653
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0046
Peak Intensity (in/hr)	2.9859
Undeveloped Runoff Coefficient (Cu)	0.9258
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	10.776
Burned Peak Flow Rate (cfs)	10.776
24-Hr Clear Runoff Volume (ac-ft)	0.5047
24-Hr Clear Runoff Volume (cu-ft)	21982.9789



ALTERNATE 4 HYDROLOGY

Peak Flow Hydrologic Analysis

File location: P:/2019/1900236 La Brea Tar Pits Design and Renovation/2 ENGR/Hydrology/Proposed_Alternative 4/Hydrocalc/Hydrocalc Output LBTP A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	LBTP Alternate 4 - Hydrology
Subarea ID	DA-4
Area (ac)	0.59
Flow Path Length (ft)	487.33
Flow Path Slope (vft/hft)	0.013194345
50-yr Rainfall Depth (in)	5.7
Percent Impervious	1.0
Soil Type	13
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

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Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	1.3536
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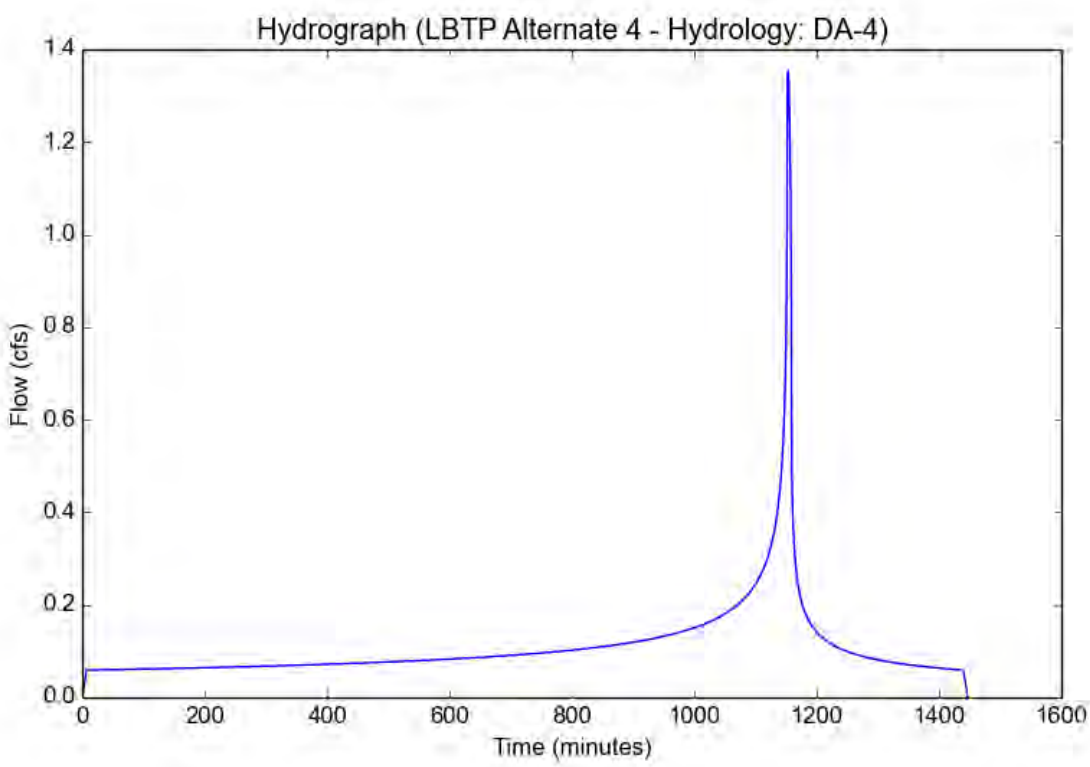
24-Hr Clear Runoff Volume (ac-ft)	0.2196
24-Hr Clear Runoff Volume (cu-ft)	9566.7992



APPENDIX I

Noise and Ground Vibration Technical Report

Noise and Ground Vibration Technical Report
La Brea Tar Pits Master Plan

Los Angeles, California

NOVEMBER 2022

PREPARED FOR

Los Angeles County Museum of Natural History Foundation

LEAD AGENCY

County of Los Angeles

PREPARED BY

SWCA Environmental Consultants

NOISE AND GROUND VIBRATION TECHNICAL REPORT
LA BREA TAR PITS MASTER PLAN
LOS ANGELES, CALIFORNIA

Prepared for:

Los Angeles County Museum of Natural History Foundation
On behalf of County of Los Angeles Museum of Natural History
900 Exposition Boulevard
Los Angeles, California 90007
Attn: Dawn McDivitt, Chief Deputy Director

Lead Agency: County of Los Angeles

Prepared by

Brad Sohm, Principal Noise Team Lead
Carlos M. Ituarte-Villarreal, Noise Specialist

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November 2022

EXECUTIVE SUMMARY

The objective of this Noise and Ground Vibration Technical Report is to evaluate and describe the potential noise and vibration impacts of the proposed La Brea Tar Pits Master Plan in Los Angeles, California. The project site is located on the eastern and northwestern portions of Hancock Park and broadly encompasses what is known as the La Brea Tar Pits.

The analysis outlines the existing noise environment in the project area, estimates future noise and vibration levels at neighboring land uses as a result of the project's construction and operation, and evaluates the potential for significant impacts. Also provided is an assessment of the project's contribution to potential cumulative noise impacts. Based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, this study has been prepared to be consistent with applicable City of Los Angeles and Los Angeles County standards and significance thresholds.

The appendices include the noise worksheets and technical data used for this study. The report presents the findings of whether a summary of the potential that the project would exceed applicable noise and vibration regulations, standards, and thresholds. The following are the results of the analyses:

- Due to on-site construction equipment and activities, surrounding noise-sensitive receptors may experience short-term and transient noise impacts during construction activities. Implementation of the below-described Mitigation Measure NOI-1, presented in Section 7.4 of this report, would minimize this impact to less than significant.
- Construction of the project would result in intermittent, transient ground-borne vibration in the vicinity of the project site; however, these impacts are not anticipated to exceed the significance thresholds. Consequently, construction vibration impacts would be less than significant.
- Operation of the project would produce noise from project-related traffic or on-site sources (parking structure, loading dock area, waste compactors, outdoor areas, and mechanical equipment) that would not exceed significance levels. Therefore, operational noise impacts would be less than significant.
- The project's operation would affect the traffic noise levels in the adjacent off-site areas. To estimate the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 13 roadway segments were calculated based on the peak-hour traffic volume change. The assessment shows that the traffic noise level increases for land uses close to the study area roadway segments are not considered significant under any of the project traffic scenarios.
- Project operation would not result in excessive vibration levels at neighboring sensitive receptors. Therefore, the long-term vibration impacts would be less than significant.
- Noise resulting from cumulative construction activities would be reduced to the extent reasonably and technical feasible through mitigation measures proposed for each project and compliance with locally enforced noise ordinances. Construction activities of other cumulative projects in the vicinity would be required to comply with the City of Los Angeles's allowed construction hours and construction would be temporary. In addition, the La Brea Master Plan project is anticipated to implement Mitigation Measure NOI-1. With implementation of this mitigation measure and compliance with City requirements, construction-related noise would have a less-than-significant cumulative impact.

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1 INTRODUCTION

The 13-acre La Brea Tar Pits site is located within the eastern and northeastern portions of Hancock Park in Los Angeles, California. The La Brea Tar Pits, the George C. Page Museum (Page Museum), and associated facilities are owned by the County of Los Angeles (County) but are managed by the non-profit Los Angeles County Museum of Natural History Foundation (Foundation). The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the Natural History Museums of Los Angeles County, including the La Brea Tar Pits and Page Museum. The Foundation proposes a redevelopment, or "reimagining," of the La Brea Tar Pits site, including renovation of the Page Museum, constructing a new museum building, and developing new amenities in surrounding portions of Hancock Park.

The County is the Lead Agency under the California Environmental Quality Act (CEQA); the Museum of Natural History is a County departmental unit. The Foundation retained SWCA Environmental Consultants (SWCA) to prepare a Noise and Ground Vibration Technical Report in support of the proposed La Brea Tar Pits Master Plan (project). The purpose of this assessment is to evaluate the project's potential construction and operational noise and vibration levels and determine the potential level of impact the project would have on the environment.

2 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The La Brea Tar Pits property (project site) is located at 5801 Wilshire Boulevard within the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902) (Figures 1 and 2). The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and is directly adjacent to the Los Angeles County Museum of Art (LACMA). The project site is located approximately 5.5 miles west from downtown Los Angeles and approximately 8.6 miles east of the Pacific Ocean. It is bounded by West 6th Street to the north (an approximately 1,200-foot-long frontage), South Curson Avenue to the east (an approximately 830-foot-long frontage), Wilshire Boulevard to the south (an approximately 500-foot-long frontage), and the LACMA to the west (an approximately 250-foot-long frontage). The area is known as the Miracle Mile neighborhood of the city of Los Angeles. The project site can be found on the U.S. Geological Survey Hollywood, California 7.5-minute quadrangle in Section 20, Township 1 South, Range 14 West.

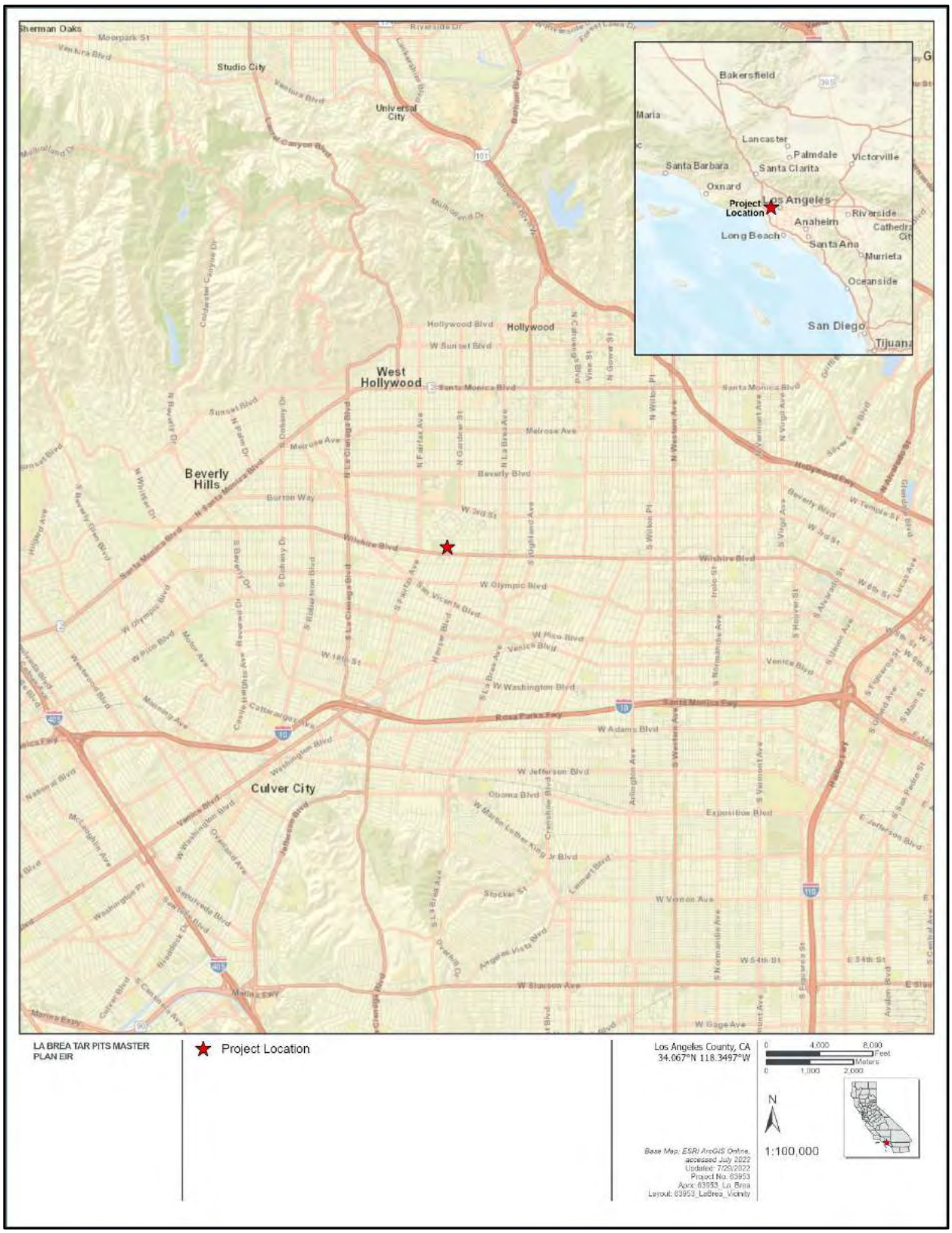


Figure 1. Project vicinity map.

Figure 2. Project location map.

1.1 Existing Conditions and Surrounding Land Uses

The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and broadly encompasses what is known as the La Brea Tar Pits, which includes the Page Museum (see Figure 2). The entirety of Hancock Park is enclosed within an 8- to 10-foot-high metal fence, which serves to secure the site by providing full closure of Hancock Park when the La Brea Tar Pits, Page Museum, and LACMA are closed in the evenings.

The George C. Page Museum is approximately 63,200 square feet and is located on the eastern portion of the project site. The project site contains multiple active fossil quarries, commonly called "tar pits." The active tar pits (Pits 3, 4, 9, 13, 61, 67, and 91) are located within the northwestern portion of the project site, along with the Observation Pit on the western boundary of the project site. Project 23[1] and Pit 91 are active fossil recovery and excavation sites also located in the northwestern portion of the project site. The Lake Pit is largest paleontological excavation pit on the grounds of Hancock Park, located in the southeastern portion of the project site.

The project site includes an approximately 28,000-square-foot multipurpose grass lawn, known as the Central Green, is located to the west of the Page Museum. Parking for the La Brea Tar Pits is located in the northeast corner of the project site, at the corner of South Curson Avenue and West 6th Street (see Figure 2). Vehicles enter and depart the lot from both directions on South Curson Avenue.

The project site is surrounded by a variety of commercial uses, museums, residential buildings, and schools. The project site is bounded by the Park La Brea Pool and multi-family residential uses to the north across West 6th Street, commercial and residential uses to the east across South Curson Avenue, the Craft Contemporary Museum and other museum and commercial uses south across Wilshire Boulevard, and museum and commercial uses to the west (see Figure 2).

2.2 Project Description

The project would result in a reimagined site design, expansion, and upgrades for the La Brea Tar Pits complex and portions of Hancock Park, including renovations to the Page Museum (Figure 3). Table 1 provides a summary of the project components; more detail on the project components is provided following the table.

2.2.1 Page Museum Renovations

The project would renovate the existing Page Museum within the same footprint as the existing building (currently approximately 63,200 square feet) to allow for enlarged exhibition space, additional storage, a ground floor café, and retail space. The central atrium would be renovated to provide additional exhibitions and provide additional classroom and laboratory space. The second floor of the Page Museum would contain two classrooms and a multipurpose space. An outdoor café and bar would be located next to these spaces on the center terrace on the west side of the Page Museum. A sloped green roof would be installed to the north of the Page Museum and would curve to the west. The project would add several sustainability features to the Page Museum. The features include enhanced daylighting, rainwater collection leading to bioswales, a sloped green roof, and rooftop solar photovoltaic panels.

[1] During construction on the LACMA parking garage in 2006, 16 new paleontological deposits were discovered, including an almost-complete skeleton of an adult mammoth. Given the size of the discoveries, 23 large wooden boxes were built around the various deposits, allowing many of the discoveries to remain intact. "Project 23" has now become the short-hand descriptor for the location and activities related to the excavation of deposits within the 23 large wooden boxes that is now occurring in a portion of the La Brea site.

Table 1. Project Components Summary

Project Component	Description
Page Museum Renovations	Renovate existing building in same footprint (approximately 63,200 square feet). Demolish existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. Construct new 2,000-gross-square-foot (gsf) satellite maintenance and support building.
New Museum Building	Construct a new two-story 40,000-gsf museum building northwest of the Page Museum including two new theaters.
Wilshire Gateway	Renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue with shaded canopy and new welcome pavilion.
The Lake Pit	Construct a pedestrian bridge and walking path over the Lake Pit. Install a new garden bioswale.
6th Street Gateway	Renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA service drive with shaded canopy and new welcome pavilion.
Tar Pits (Pits 3, 4, 9, 13, 61, 67, and 91; Project 23)	Renovate the existing facilities at all the tar pits in the northwestern portion of the project site.
Pedestrian Path and Recreation Areas	Reconfigure the existing pedestrian pathways on-site into a continuous 1-kilometer-long paved pedestrian path linking existing features on the project site. Improvements to the Central Green (establish a drivable path for food truck access). Establish a children's play area, picnic areas, and a small dog park west of the 6th Street Gateway.
Circulation and Parking	Expand existing parking lot from 63,000 square feet to 65,000 square feet and relocate approximately 50 to 70 feet to the north. This would require removal and relocation of existing trees on-site. Increase vehicle parking spaces approximately 5 to 15 spaces for a total of 160 to 170 vehicle parking spaces. Addition of new landscaping and vehicle access lanes to the parking lot. Establish new school drop-off/loading area approximately 215 to 230 feet long on South Curson Avenue adjacent to the Wilshire Gateway picnic area.
Landscaping Concept Plan	Establish three distinct landscaping zones encircled by looping pedestrian path. Creation of biofiltration areas for stormwater management. Introduction or relocation of approximately 84 trees from existing locations on-site to new locations on-site.

Figure 3. Proposed site plan.

In addition, the project would demolish the existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. A new 2,000-gross-square-foot (gsf) satellite maintenance and support building would be constructed for additional storage, administration, and research space directly west of the parking lot.

2.2.2 New Museum Building

A new two-story museum building would be located to the northwest of the Page Museum (see Figure 3). The building would be approximately 40,000 gsf and would increase the total museum square footage to 104,000 gsf. The new museum building would include an extended central lobby, exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock.

The Page Museum and new museum building would be continuously connected on the first floor. The first-floor central lobby would face southwest toward the Central Green and branch off into the Page Museum to the east and the new museum building to the west. An updated retail and café space would be located off the lobby and look out over the Central Green. The Page Museum and the new museum buildings would be disconnected on the second floor, which would rise above the earthen berm. The separated facilities would be accessible through sloped outdoor walkways from the Central Green or interior staircases in the museum. There would be pedestrian entrances leading into the central lobby from the Central Green and from the parking lot. The existing Page Museum entrance would be converted to an educational group and tour entrance, which would be connected to a new school drop-off area on South Curson Avenue.

2.2.3 Entrance Renovation and Other Internal Circulation Improvements

The project would renovate the existing entrance to the La Brea Tar Pits located at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza; this would provide orientation, spaces for gathering and queuing, and restrooms (see Figure 3). A picnic area would also be located under the shaded canopy.

A pedestrian bridge and walking path would be constructed over the Lake Pit. Directly to the east of the Lake Pit, a new garden bioswale would be installed to manage stormwater and would include vegetation related to the relocated mammoths and mastodon sculptures.

A school drop-off area on South Curson Avenue would lead directly to the education museum entrance, enabling the choreography of student tour itineraries that are distinct from general museum visitors and other tour groups.

The project would renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA parking garage. Similar to the Wilshire Gateway, a shaded canopy and welcome pavilion would provide orientation, legibility, and amenities. As a visible point of arrival from the residential communities to the north, this new entry would welcome visitors to a shaded park space where community park and recreational needs are balanced with the research activities of La Brea. Under the canopy of shade trees, visitors would find diverse destinations, including play areas, picnic areas, seating and interpretation zones at the protected tar seeps, the gentle topography and bioswales along Oil Creek, and the revitalized destinations of the Dorothy Brown Amphitheater, Observation Pit, and Pit 91. Along the south edge of the loop path, connections would allow access to other Hancock Park programs and transportation connections.

3 CONSTRUCTION TIME FRAME AND PHASING

Construction of the project, from mobilization to the site to final completion, is expected to occur between 2024 and 2027, and would last for approximately 4 years. The project would be constructed in five phases: 1) demolition and project site preparation; 2) installation of infrastructure improvements; 3) development of the proposed new museum building and parking lot; 4) landscaping and hydroseeding; and 5) roadway improvements. Blasting is not anticipated for the construction of this project. The estimated construction scheduling for the project is presented in Table 2.

Table 2. Construction Schedule

Phase	Start Date	End Date	Days/Week	Workdays per Phase
Demolition	1/1/2024	10/31/2024	6	262
Site preparation	1/1/2024	10/31/2024	6	262
Grading	11/1/2024	12/31/2024	6	52
Building construction	1/1/2025	5/31/2027	6	755
Paving	6/1/2027	12/31/2027	6	184
Architectural coating	7/1/2026	9/30/2026	6	79

For this analysis, project construction has been divided into six phases based on the types of equipment required and workload: 1) demolition; 2) site preparation; 3) grading; 4) building construction; 5) paving; and 6) architectural coating (see Table 2).

4 ENVIRONMENTAL SETTING

4.1 Noise Fundamentals

This section provides a brief overview of noise fundamentals, noise assessment components, and examples of sound levels from a variety of sources.

4.1.1 Definition of Acoustical Terms

Noise is commonly defined as sound that is undesirable because it interferes with speech communication and hearing, causes sleep disturbance, or is otherwise annoying. The following acoustical terms are used throughout this analysis:

- Ambient sound level is defined as the composite of noise from all sources near and far, i.e., the normal or existing level of environmental noise at a given location.
- Decibel (dB) is the physical unit commonly used to measure sound levels. Technically, a dB is a unit of measurement that describes the amplitude of sound equal to 20 times the base 10 logarithm of the ratio of the reference pressure to the sound of pressure, which is 20 micropascals (μPa).
- Sound measurement is further refined by using a decibel “A-weighted” sound level (dBA) scale that more closely measures how a person perceives different frequencies of sound; the A-weighting reflects the sensitivity of the ear to low or moderate sound levels.
- Equivalent noise level (L_{eq}) is the energy average A-weighted noise level during the measurement period.

- The root-mean-squared maximum noise level (L_{max}) characterizes the maximum noise level as defined by the loudest single noise event over the measurement period.
- Day-Night Sound Level (L_{dn}) is the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB weighting imposed on the equivalent sound levels occurring during nighttime hours (10:00 p.m. to 7:00 a.m.).
- Community Noise Equivalent Level (CNEL) is a measure of the 24-hour average noise level that penalizes noise that occurs during the evening and nighttime hours, when noise is considered more disturbing. To account for this increase in disturbance, 5 A-weighted decibels (dBA) is added to the hourly L_{eq} during the evening hours (7:00 p.m. to 10:00 p.m.) and 10 dBA is added during the nighttime hours (10:00 p.m. to 7:00 a.m.).
- Percentile-Exceeded Sound Level (L_{xx}) describes the sound level exceeded for a given percentage of a specific period.
- Noise-sensitive land use is defined as a location most likely to be adversely affected by excessive noise levels, or as a place where quiet is an essential element of their intended purpose.

4.1.2 Sound Levels of Representative Sounds and Noises

The U.S. Environmental Protection Agency (EPA) has developed an index to assess noise impacts from a variety of sources using residential receptors. Noise levels in a quiet rural area at night are typically between 32 and 35 dBA. Quiet urban nighttime noise levels range from 40 to 50 dBA. Noise levels during the day in a noisy urban area are frequently as high as 70 to 80 dBA. Noise levels above 110 dBA become intolerable; levels higher than 80 dBA over continuous periods can result in hearing loss. Levels above 70 dBA tend to be associated with task interference. Levels between 50 and 55 dBA are associated with raised voices in a normal conversation (EPA 1974).

Table 3 provides criteria that have been used to estimate an individual's perception to increases in sound. In general, an average person perceives an increase of 3 dBA or less as barely perceptible. An increase of 10 dBA is perceived as a doubling of the sound.

Table 3. Average Human Ability to Perceive Changes in Sound Levels

Increase in Sound Level (dBA)	Human Perception of Sound
2–3	Barely perceptible
5	Readily noticeable
10	Doubling of the sound
20	Dramatic change

Source: Bolt, Beranek and Newman, Inc. (1973)

Table 4 presents sound levels for some common noise sources and the human response to those decibel levels.

Table 4. Sound Levels of Representative Sounds and Noises

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: California Department of Transportation (2022:112)

4.1.3 Noise Assessment Components

A noise assessment is based on the following components: a sound-generating source, a medium through which the source transmits and the pathways taken by these sounds, and an evaluation of the proximity to noise receptors. Soundscapes are affected by the following factors:

- Source. The sources of sound are any generators of small back-and-forth motions (i.e., motions that transfer their motional energy to the transmission path where it is propagated). The acoustic characteristics of the sources are very important. Sources must generate sound of sufficient strength, approximate pitch, and duration so that the sound may be perceived and can cause adverse effects, compared with the natural ambient sounds.
- "Transmission path" or medium. The "transmission path" or medium for sound or noise is most often the atmosphere (i.e., air). For the noise to be transmitted, the transmission path must support the free propagation of the small vibratory motions that make up the sound. Atmospheric conditions (e.g., wind speed and direction, temperature, humidity, precipitation) influence the attenuation of sound. Barriers and/or discontinuities (e.g., existing structures, topography, foliage, ground cover, etc.) that attenuate the flow of sound may compromise the path. For example, sound will travel very well across reflective surfaces such as water and pavement but can attenuate across rough surfaces (e.g., grass, loose soil).
- Proximity to receptors. A receptor is usually defined as a location where a state of quietness is a basis for use or where excessive noise interferes with the normal use of the location. Typical receptors include residential areas, monuments, schools, hospitals, churches, and libraries.

4.2 Ground-borne Vibration Fundamentals

This chapter describes basic concepts related to ground-borne vibration. Ground-borne vibration is a small, rapidly fluctuating motion transmitted through the ground. When seismic waves are perceptible,

when they can be felt, they are called "ground vibrations." Seismic waves are divided into two classes: body waves and surface waves.

1. Body waves travel across the mass of the rock, penetrating down into the interior of the rock mass. There are two forms of body waves: compressional waves and shear waves.
   The compressional wave (P-wave) is a push-pull type wave that produces alternating compression and dilatation in the direction of wave travel. The shear wave (S-wave) is produced when the medium particles oscillate perpendicular to the propagation direction.
2. Surface waves (L-waves) travel over the surface of rock mass but do not travel through it. Surface waves are generated by body waves that are constrained by physical and geometrical conditions from traveling into the rock mass. Surface waves are the large energy carriers and account for the largest ground motions. There are two fundamental types of surface waves: the Raleigh, and the Love waves (Q-wave). Raleigh and Love waves represent the energy measured by a seismograph and are the main component of vibration when examining ground vibration from blasting activities.

The ground vibration from surface waves is measured as the velocity of motion, or how many inches per second (in/sec) the ground is moving. The motion of the ground particles (vibration) happens in three dimensions: radial, transverse, and vertical. During vibration, each particle has a velocity, and the maximum velocity is referred to as the peak particle velocity (PPV). The resulting vector of all three components (i.e., radial, transverse, and vertical) combined is referred to as peak vector sum (PVS).

The industry standard is to use the readings of the PPV as the metric to measure the intensity of the ground vibration. In reporting, the maximum measurement of any of the three components is used rather than the resulting PVS.

4.2.1 Ground Vibration Terms

Ground vibration is described using the following terms:

- Acceleration—The rate at which particle velocity changes.
- Crest factor—The ratio of peak particle velocity to maximum root mean square amplitude in an oscillating signal.
- Displacement—The farthest distance that the ground moves before returning to its original position.
- Frequency—The number of oscillations per second that a particle makes when under the influence of seismic waves.
- Hertz (Hz)—The unit of acoustic or vibration frequency representing cycles per second.
- Peak particle velocity (PPV)—The greatest particle velocity associated with an event.
- Peak vector sum (PVS)—The square root of the sum of the squares of the individual PPV values in all three vector directions.
- Particle velocity—The velocity at which the ground moves.
- Propagation velocity—The speed at which a seismic wave travels away from the blast.
- Root Mean Square (RMS)—The square root of the mean-square value of an oscillating waveform, where the mean-square value is obtained by squaring the value of amplitudes at each instant of time and then averaging these values over the sample time.

- Vibration Velocity Level (LV)—Ten times the common logarithm of the ratio of the square of the amplitude of the RMS vibration velocity to the square of the amplitude of the reference RMS vibration velocity.

4.2.2 Ground Vibration and Structure Damage

Ground vibrations can produce permanent changes in the relative positions of "particles" that constitute structures. Because these permanent changes are unwanted, they are colloquially referred to as "damage". The larger the vibration (i.e., the higher the ground movement speed), the greater is the potential for these permanent shifts in particle positions in structures.

Table 5 summarizes the effects of peak particle velocities on structures and materials that have been documented by various researchers and organizations.

Table 5. Effect of Vibration on Materials and Structures

PPV (in/sec)	Application	Effect	Reference
0.03	Residential structure	Equivalent to walking on floor	Stagg et al. (1980)
0.3	Residential structure	Equivalent to jumping on floor	Stagg et al. (1980)
0.1–0.5	Residential structure	Equates to normal daily family activity	Stagg et al. (1980)
0.5	Mercury switch	Trips switch	Bauer and Calder (1977)
0.5	Residential structure	Equivalent to door slam	Stagg et al. (1980)
0.9	Residential structure	Equivalent to nail driving	Stagg et al. (1980)
<2.0	Residential structure	No damage	Edwards and Northwood (1960)
<2.0	Residential structure	No damage	Nichols et al. (1971)
2	Plaster	Safe level of vibration	E. I. du Pont de Nemours & Co. (1977)
2	Residential structure	Plaster can start to crack	Bauer and Calder (1977)
2.8	Residential structure	No damage	Langefors et al. (1958)
1.2–3.0	Residential structure	Equates to daily environmental changes	Stagg et al. (1980)
3	Plaster	Threshold of cosmetic cracking	Northwood et al. (1963)
2.8–3.3	Plaster	Threshold of damage (from close-in blasts)	E. I. du Pont de Nemours & Co. (1977)
2.0–4.0	Residential structure	Caution range	Edwards and Northwood (1960)
2.0–4.0	Residential structure	Plaster cracking (cosmetic)	Nichols et al. (1971)
>4.0	Residential structure	Probable damage	Edwards and Northwood (1960)
4.3	Residential structure	Fine cracks in plaster	Langefors et al. (1948)
4.5	Plaster	Minor cracking	Northwood et al. (1963)
5.4	Plaster	50% probability of minor damage	E. I. du Pont de Nemours & Co. (1977)
5.44	Water wells	No change in well performance	Robertson et al. (1980)
6.3	Residential structure	Plaster and masonry walls crack	Langefors et al. (1948)
<6.9	Residential structure	No damage observed	Wiss and Nichols (1974)

PPV (in/sec)	Application	Effect	Reference
4.0–7.0	Residential structure	Minor damage possible	Nichols et al. (1971)
>7.0	Residential structure	Major damage possible	Nichols et al. (1971)
7.0–8.0	Cased water wells	No adverse effect on well	Rose et al. (1991)
7.6	Plaster	50% probability of major damage	E. I. du Pont de Nemours & Co. (1977)
8	Concrete blocks	Cracking in blocks	Bauer and Calder (1977)
8	Plaster	Major cracking	Northwood et al. (1963)
9.1	Residential structure	Serious cracking	Langefors et al. (1958)
<10	Rock	No fracturing of intact rock	Bauer and Calder (1978)
>12	Rock	Rock falls in underground tunnels	Langefors et al. (1958)
12	Rock	Rock falls in unlined tunnels	E. I. du Pont de Nemours & Co. (1977)
15	Cased drill holes	Horizontal offset	Bauer and Calder (1977)
24	Rock	Rock fracturing	Langefors et al. (1958)
10–25	Rock	Minor tensile slabbing	Bauer and Calder (1978)
25	Rock	Damage can occur in rock masses	Oriard (1970)
25	Explosive near buried pipe	No damage	Siskind and Stagg (1993)
40	Mechanical equipment	Shafts misaligned	Bauer and Calder (1977)
100	Explosives near concrete	No damage	Oriard and Coulson (1980)
25–100	Rock	Tensile and some radial cracking	Bauer and Calder (1978)
100	Explosives inside concrete	Spalling of fresh grout	Tart et al. (1980)
>100	Rock	Complete breakup of rock masses	Bauer and Calder (1978)
50–150	Explosive near buried pipe	No damage	Oriard (1994)
200	Explosives inside concrete	Spalling of loose/weathered concrete skin	Tart et al. (1980)
375	Explosives inside concrete	Radial cracks develop in concrete	Tart et al. (1980)
600	Explosives inside concrete	Mass blowout of concrete	Tart et al. (1980)

Source: Modified from California Department of Transportation (2020:Table 22),

While structural damage associated with ground vibration can occur, noticeable vibration damage is often seen as cracks in drywall or plaster and exterior surfaces such as grout and stucco. This may, or may not, be a sign of structural damage. Since such cosmetic damage can also be caused by settling, temperature changes, and normal aging; overall, a few hairline cracks found in a house does not necessarily indicate a vibrational cause.

4.2.3 Ground Vibration and Human Perception

In addition to concerns about structural damage, under specific conditions, humans can be startled or annoyed by ground vibration. Human response to vibration is hard to evaluate due to differences in individual perception. Humans can detect lower levels of ground vibration than those levels discussed in Section 4.2.2 that could adversely impact structures. The human body can distinctively perceive ground vibration as low as 0.1 inch per second, with some people being able to perceive even lower levels.

The reason the public may perceive ground vibration as annoying is because it is an A-Cultural Vibration—that is, something that occurs that people are not used to experiencing. For example, vibration produced by a blast is unique and one does not expect it; therefore, an individual may report on the vibration to a much larger extent (Konya 2019). Additionally, the rattling of objects in the immediate surroundings influences the occupants to look for cracks in their residences. Dowding (1996) sees this as human sensitivity being triggered by vibrations that give rise to their inquiring minds.

Table 6 indicates the average human response to vibration that may be anticipated when the person is at rest, situated in a quiet surrounding.

Table 6. Human Response to Ground Vibration

Average Human Response	PPV (in/sec)
Barely to distinctly perceptible	0.020–0.10
Distinctly to strongly perceptible	0.10–0.50
Strongly perceptible to mildly unpleasant	0.50–1.00
Mildly to distinctly unpleasant	1.00–2.00
Distinctly unpleasant to intolerable	2.00–10.00

Source: California Department of Transportation (2020)

Section 12.08.350 of the Los Angeles County Noise Control Ordinance defines “vibration” as the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observations of moving objects, and assumes a human perception threshold of 0.01 in/sec over the range of 1 to 100 hertz.

4.2.4 Vibration Assessment Components

Vibration energy extends out as it travels through the ground, causing the vibration level to reduce with respect to the distance from the source. High-frequency vibration decreases much more rapidly than low frequencies, so that low frequencies tend to dominate the spectrum at large distances from the source. The propagation of ground-borne vibration is not simple to model due to geological differences in the medium (ground). Geological factors that may influence the propagation of ground-borne vibration include the following:

- Soil conditions. The type of soil has a strong influence on the propagation of ground-borne vibration. Hard, dense, and compacted soil, stiff clay soil, and hard rock transfer vibration more efficiently than loose, soft soils, sand, or gravel.
- Depth to bedrock. Shallow depth to bedrock provides more efficient propagation of ground-borne vibration. Shallow bedrock concentrates the vibration energy near the surface, reflecting vibration waves back toward the surface that would otherwise continue to propagate farther down into the earth.
- Soil strata. Discontinuities in the soil layering can produce diffractions or channeling effects that impact the propagation of vibration over long distances.
- Frost conditions. Seismic waves typically propagate more efficiently in frozen soils than in unfrozen soils.
- Water conditions. The amount of moisture in the soil has an impact on vibration propagation. The depth of the water table in the path of the propagation also has substantial effects on ground-borne vibration levels.

Specific conditions at the source and receptor locations can also affect the vibration levels. For instance, how the source is connected to the ground (e.g., direct contact or via a structure) or when the source is underground versus on the surface will impact the amount of energy transmitted into the ground. At the receptor, vibration levels can be affected by variables such as the building construction and the foundation type.

4.3 Existing Conditions

4.4 Existing Land Use and Site Conditions

The project site is in an urbanized area surrounded by a variety of commercial uses, museums, and residential buildings. The project site is bounded by the Park La Brea Pool and multi-family residential uses to the north across West 6th Street, commercial and residential uses to the east across South Curson Avenue, the Craft Contemporary Museum and other museum and commercial uses south across Wilshire Boulevard, and museum and commercial uses to the west. The predominant noise sources in the vicinity of the project site are vehicular traffic, commercial activities, park visitors, landscaping equipment, parking lot activities, and construction noise from projects that are being developed in the area.

Noise-sensitive land uses are commonly defined as locations most likely to be adversely affected by excessive noise levels. As defined in the *Noise Element of the City of Los Angeles General Plan* (City of Los Angeles 1999), noise-sensitive land uses include single- and multi-family dwellings, long-term care facilities, motels, hotels, transient lodgings, and other residential uses; places of worship; hospitals; libraries; schools; nature and wildlife preserves; parks; auditoriums; concert halls; and outdoor theaters (City of Los Angeles 2006).

As presented in Section 4.2, the potential ground-borne vibration can be divided into building damage and potential human annoyance. Because building damage would be considered a permanent negative effect at any building, regardless of land use, all buildings are considered sensitive to this type of impact. Human annoyance from ground-borne vibration is only considered inside occupied buildings and not at outside areas such as parks or playgrounds. Therefore, buildings that would be considered sensitive to human annoyance caused by vibration are generally the same as those that would be sensitive to noise.

Based on the review of the land uses in the project area, four off-site residential receptors (referenced hereafter as monitoring locations ST2, ST3, ST5, and ST6) were selected to represent noise-sensitive uses in the project area. Additionally, four commercial receptors (referenced hereafter as monitoring locations ST7, ST8, ST9, and ST10) were selected to evaluate potential noise and vibration impacts adjacent to the project site (Figure 4).

4.5 Existing Sound Conditions

4.5.1 Measurement Locations

To determine the baseline or ambient sound levels experienced near the project area and at the closest noise-sensitive uses, long-term and short-term sound monitoring was conducted from April 7 to April 9, 2022, to document the acoustic environment in the area surrounding the proposed project. Figure 4 shows the noise measurement locations and Table 7 describes the selected noise monitoring sites.

Figure 4. Noise measurement locations.

Table 7. Noise Monitoring Locations

Monitoring Location	Description	Approximate Distance from Measuring Location to Nearest Project Site Boundary*	Nearest Noise Land Use(s)
LT1	Northeast corner of the Lake Pit.	–	–
LT2	Northeast corner of Pit 13.	–	–
ST2	Multi-family residence on the north side of West 6th Street, northwest of the project site.	160 feet	Multi-Family Residential
ST3	Multi-family residence on the north side of West 6th Street, northwest of the project site.	72 feet	Multi-Family Residential
ST5	Multi-family residence on the north side of West 6th Street, northeast of the project site.	90 feet	Multi-Family Residential
ST6	Multi-family residence on the east side of Curson Avenue, east of the project site.	59 feet	Multi-Family Residential
ST7	Mixed-use commercial building on the east side of Curson Avenue, east of the project site.	61 feet	Commercial
ST8	Office building on the south side of Wilshire Boulevard, southeast of the project site.	124 feet	Commercial
ST9	Commercial building on the south side of Wilshire Boulevard, south of the project site.	114 feet	Commercial
ST10	Commercial building on the south side of Wilshire Boulevard, southwest of the project site.	669 feet	Commercial

* Distances are estimated using 2021 map data from Google Earth (2022)

Two long-term and eight short-term noise monitoring locations were selected to provide the existing ambient noise levels near and at the project's site. The specific placement of the sound level meters was mainly determined by environmental and logistical constraints, and the location of the closest noise-sensitive land uses. The long-term noise monitors were placed at the southeast and northwest corners of the proposed project site. Short-term monitors were placed at the neighboring noise-sensitive land uses and commercial locations to provide good coverage of the area surrounding the project site.

4.5.2 Instrument Description

Noise measurements were collected using three Larson Davis Precision Integrating Sound Level Meter Model 831C units, meeting the requirements of the American National Standards Institute (ANSI) (ANSI 2013), three PCB PRM831 preamplifiers, and three PCB 377B02 free-field microphones (Table 8).

Microphones were fitted with an environmental windscreen and bird spikes and set on a tripod at a height of 5 feet above ground, and located as far from the influence of vertical reflective sources as possible. All cables were secured to prevent any sounds due to wiring hitting other objects. All clocks associated with the sound measurement were synchronized using the Larson Davis G4 LD Utility software.

Table 8. Instrumentation Used

Monitoring Location	Sound Level Meter	Preamplifier	1/2-inch Free-Field Microphone
LT1	Larson Davis 831C (S/N 0011655)	PRM831 (S/N 76995)	377B02 (S/N 173681)
LT2	Larson Davis 831C (S/N 0011585)	PRM831 (S/N 46400)	377B02 (S/N 108355)

ST2, ST3, ST5, ST6, ST7, ST8, ST9, ST10	Larson Davis 831C (S/N 0011655)	PRM831 (S/N 76995)	377B02 (S/N 173681)

4.5.3 Calibration Checks

The sound level meters was calibrated at the beginning and end of each measurement period using a Larson Davis Model CAL200 Precision Acoustic Calibrator. The Larson Davis CAL200 emits a 1 kilohertz (kHz) tone at 114 dB against which the response can be checked. The calibrator has been designed for both field and laboratory use and the accuracy has been calibrated to a reference traceable to the National Institute of Standards and Technology.

The LD 831C sound level meters showed a response of less than the normal error of 0.50 dB. The results of the calibrations are shown in Table 9.

Table 9. Pre- and Post-Instrument Response Checks

Monitoring Location	Pre-Test	Post-Test	Deviation (dBA)*
LT1	4/7/22 8:52 a.m.	4/9/22 8:09 a.m.	−0.01
LT2	4/7/22 9:20 a.m.	4/9/22 8:36 a.m.	−0.07
ST2	4/9/22 9:28 a.m.	4/9/22 9:44 a.m.	0.04
ST3	4/9/22 9:50 a.m.	4/9/22 10:07 a.m.	0.01
ST5	4/7/22 10:24 a.m.	4/7/22 10:42 a.m.	0.05
ST6	4/7/22 10:47 a.m.	4/7/22 11:04 a.m.	0.03
ST7	4/7/22 11:09 a.m.	4/7/22 11:25 a.m.	−0.03
ST8	4/7/22 11:31 a.m.	4/7/22 11:48 a.m.	−0.04
ST9	4/7/22 11:56 a.m.	4/7/22 12:16 p.m.	0.17
ST10	4/7/22 12:30 p.m.	4/7/22 1:02 p.m.	−0.34

* Calibration deviation indicates the difference between the values measured by the instrument and the tone emitted by the acoustic calibrator.

4.5.4 Meteorological Data

Meteorological data were not measured at the monitoring sites during the measurement period. Instead, noise data collected during the survey were validated against weather data from the Enrique Noguera Educational Garden Station (KCALOSAN1004), located approximately 2.3 miles northeast of the project site. Hourly weather information is presented in Appendix A. A summary of the survey weather conditions is provided in Table 10.

Table 10. Weather Conditions for April 7 through April 9, 2022

Weather Station	Start	End	Wind Speed (mph)		Temperature (°F)		Humidity (% relative humidity)	
			Range	Average	Range	Average	Range	Average
Enrique Noguera Educational Garden (KCALOSAN1004)	4/7/2022 00:00	4/9/2022 23:59	0.0–5.1	0.7	61.0–96.5	77.5	8–77	32

Source: Weather Underground (2022)

The American Society for Testing and Materials (ASTM) *Standard Guide for Measurement of Outdoor A-Weighted Noise Levels* (ASTM E1014-12; 2012) specifies that data should not be used when steady wind speeds exceed 20 kilometers per hour (12.4 miles per hour [mph]). Because wind speeds above 12.4 mph were not identified, no hourly data points were removed from any of the noise data sets.

4.5.5 Readings

Long-term monitoring was conducted from April 7 to April 9, 2022. Sound meter LD 831C – 0011655 was placed at the monitoring location LT1 from 8:58 a.m. (Pacific Daylight Time [PDT]) on April 7 to 8:09 a.m. (PDT) on April 9. Data were collected for approximately 47 hours; sound levels were recorded over each 1-minute and 1-hour interval. Sound meter LD 831C – 0011585 was placed at the monitoring location LT2 from 9:22 a.m. (PDT) on April 7 to 8:35 a.m. (PDT) on April 9. Data were collected for approximately 47 hours; sound levels were recorded over each 1-minute and 1-hour intervals.

Short-term monitoring was conducted at eight monitoring locations. Start and stop times for the eight short-term monitoring sites are presented in Table 11. Short-term sound levels were recorded for a single 15-minute interval.

The sound level meters were programmed to sample and store A-weighted sound level data including L_{eq}, percentile levels, and community sound parameters. The following gives a brief description of the methodology used for the sound data collection.

- A-weighted sound level was selected.
- Sound meter was set on “slow” response.
- During noise measurements any dominant background noise source was noted.
- Weather conditions were observed and documented.

Field data sheets were completed during each visit and are provided in Appendix A of this report.

Observed sources of background noise that contributed to the existing sound level at the monitoring locations included vehicular traffic, commercial activities, park visitors, landscaping equipment, parking lot activities, and construction noise. No data points were excluded from the results interference as all the major noise-contributing sources were determined to be representative of the ambient soundscape.

Ambient noise levels for the long-term monitoring sites are represented by the equivalent noise level (L_{eq}) due to the duration of the monitoring period, as it provides a measure of the aggregate sound at a location. L_{eq} is represents the level of continuous sound over a given period that would deliver the same amount of energy as the actual, varying sound exposure, therefore making noise from sporadic anthropogenic noises, wildlife, and wind gusts part of the overall ambient noise level.

Evening noise levels at the short-term monitoring sites were assumed to be equal to the measured daytime noise levels. Nighttime noise levels were assumed to be 10 dBA lower than the measured daytime noise.

4.5.6 Results

Data collection began on April 7, 2022, and continued through April 9, 2022. Table 11 summarizes the measured A-weighted L_{eq}, L_{dn}, and CNEL (calculated from the measured L_{eq}) for each of the monitoring locations.

Table 11. Measured Existing Ambient Noise Levels

Monitoring Location	Start	Stop	Measured Noise Levels (dBA)				Estimated Noise Levels (dBA)	
			Daytime Hours (7:00 a.m.–7:00 p.m.)	Evening Hours (7:00 p.m.–10:00 p.m.)	Nighttime Hours (10:00 p.m.–7:00 a.m.)	L_{90} (24-hour)	L_{dn}* (24-hour)	CNEL* (24-hour)
LT1	2022-04-07 08:58:16	2022-04-09 08:09:16	58.9	54.2	53.0	46.6	60.6	60.9
LT2	2022-04-07 09:22:07	2022-04-09 08:35:39	56.6	54.2	51.7	46.0	59.1	59.5
ST2	2022-04-09 09:28:56	2022-04-09 09:43:57	67.5	-	-	52.1	66.7	68.1
ST3	2022-04-09 09:51:40	2022-04-09 10:06:42	65.5	-	-	51.8	65.3	66.4
ST5	2022-04-07 10:26:12	2022-04-07 10:41:13	74.9	-	-	56.1	73.1	75.1
ST6	2022-04-07 10:48:38	2022-04-07 11:03:41	62.8	-	-	51.5	63.8	64.4
ST7	2022-04-07 11:09:19	2022-04-07 11:24:22	64.8	-	-	54.6	64.9	65.9
ST8	2022-04-07 11:32:22	2022-04-07 11:47:27	69.8	-	-	57.1	68.5	70.2
ST9	2022-04-07 11:58:31	2022-04-07 12:13:33	74.6	-	-	63.7	72.8	74.8
ST10	2022-04-07 12:31:39	2022-04-07 12:46:47	67.1	-	-	54.7	66.4	67.8

Note: L_{90} is the sound level exceeded 90% of the time of the measurement period. Ldn is the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB weighting imposed on the equivalent sound levels occurring during nighttime hours (10:00 p.m. to 7:00 a.m.).

* Estimated from measured daytime noise levels and estimated nighttime levels based on the presented nighttime hours in the Presumed Ambient Noise Levels, City of Los Angeles Municipal Code, Section 111.03.

As shown in Table 11, the daytime noise levels in project vicinity ranged between 62.8 and 74.9 dBA L_{eq}. The two long-term noise measurements (LT1 and LT2) indicate that the average hourly noise levels during daytime hours ranged between 56.6 and 58.9 dBA L_{eq} and between 59.5 and 60.9 dBA CNEL at the project site.

4.5.7 Existing Traffic Noise

In addition to the noise measurements, the existing traffic noise on local roadways in the surrounding areas was calculated to quantify the 24-hour CNEL noise levels using data provided by the draft transportation assessment prepared for the project (Traffic Study; Kittelson & Associates, Inc. 2022). Thirteen roadway segments were selected to represent the existing noise conditions for the analysis. Traffic noise levels were calculated using a proprietary noise model (i.e., SoundPlan Essential v5.1) based on the Federal Highway Administration (FHWA) Traffic Noise Model Version 2.5 (FHWA 2004). The inputs used in the traffic noise modeling included hourly traffic volumes, assumed traffic mix and daily distribution (the percentage of automobiles versus medium trucks and heavy trucks during each hour of the day), and traffic speeds based on the posted speed limits.

The Traffic Study did not directly analyze Average Daily Traffic (ADT) on the road segments in the project site vicinity. The Traffic Study provides an estimate of ADT volumes based on the weekday morning (7:00 a.m.–9:00 a.m.), midday (12:00 p.m.–2:00 p.m.), and afternoon (4:00 p.m.–6:00 p.m.) peak

periods' peak hourly intersection volumes for existing traffic. The Traffic Noise Model prediction model calculated an hourly L_{eq} level for each road segment based on the peak morning, midday, and afternoon intersection volumes presented in the Traffic Study for existing traffic and the lateral distance between the road segments and the receptors. Receptors were placed at the closest building façade along the road segment. The 24-hour CNEL levels were then estimated from the estimated L_{eq} values assuming 80% of the total daily traffic occurs during daytime hours (7:00 a.m.–7:00 p.m.), 10% during evening hours (7:00 p.m.–10:00 p.m.), and 10% during nighttime hours (10:00 p.m.–7:00 a.m.). Vehicle mix/distribution information used in the noise calculations is shown in Table 12. Detailed calculation worksheets are included in Appendix B.

Table 12. Vehicle Mix for Traffic Noise Model

Vehicle Type	Daytime Hours (7:00 a.m.–7:00 p.m.)	Evening Hours (7:00 p.m.–10:00 p.m.)	Nighttime Hours (10:00 p.m.–7:00 a.m.)	Total Percentage of ADT per Vehicle Type
Automobile	78.4%	9.8%	9.8%	98%
Medium truck	0.0%	0.0%	0.0%	0%
Heavy truck	1.6%	0.2%	0.2%	2%
Total	**80.0%**	**10.0%**	**10.0%**	**100%**

Table 13 presents the estimated traffic noise levels for the analyzed roadway segments based on existing traffic volumes for both a weekday and weekend. The estimated existing CNEL due to roadway traffic ranges from 62.6 dBA to 71.7 dBA for weekdays, and between 60.8 dBA and 69.8 dBA during weekends (see Table 13).

Table 13. Existing Roadway Traffic Noise Levels

Roadway Segment		Adjacent Land Use	Calculated Traffic Noise Levels, CNEL*		Noise-Sensitive Land Uses?	Existing Noise Exposure Compatibility Category†
			Weekday (dBA)	Weekend (dBA)		
6th Street	Between Fairfax Avenue and Ogden Drive	Residential	71.3	69.8	Yes	Normally unacceptable
	Between Ogden Drive and Curson Avenue	Residential	71.7	67.7	Yes	Normally unacceptable
	East of Curson Avenue	Residential	71.0	67.7	Yes	Normally unacceptable
Ogden Drive	North of 6th Street	Residential	62.6	60.8	Yes	Conditionally acceptable
	South of Wilshire Boulevard	Commercial	62.9	60.8	No	Normally acceptable
Spaulding Avenue	South of Wilshire Boulevard	Commercial	64.9	63.2	No	Normally acceptable
Curson Avenue	North of 6th Street	Residential	67.3	64.8	Yes	Conditionally acceptable
	Between 6th Street and Wilshire Boulevard	Residential	68.1	67.6	Yes	Conditionally acceptable
	South of Wilshire Boulevard	Residential	71.0	69.1	Yes	Normally unacceptable

Roadway Segment		Adjacent Land Use	Calculated Traffic Noise Levels, CNEL*		Noise-Sensitive Land Uses?	Existing Noise Exposure Compatibility Category†
			Weekday (dBA)	Weekend (dBA)		
Wilshire Boulevard	Between Fairfax Avenue and Ogden Drive	Museum	68.3	66	No	Normally acceptable
	Between Ogden Drive and Spaulding Avenue	Commercial	67.2	65.1	No	Normally acceptable
	Between Spaulding Avenue and Curson Avenue	Museum	69.4	67.0	No	Normally acceptable
	East of Curson Avenue	Commercial	67.8	65.8	No	Normally acceptable

* Detailed calculation worksheets are included in Appendix B.

† Noise compatibility is based on the most stringent land use and the higher of the calculated CNEL during weekday and weekend days.

4.6 Existing Ground-Borne Vibration Conditions

The primary ground-borne vibration source at urban settings is vehicular traffic. It is unusual for vibration from traffic sources to be perceptible, as trucks and buses typically generate vibration velocity levels of approximately 63 vibration velocity decibels (VdB) at 50 feet (Federal Transit Administration [FTA] 2018). Normally, 75 VdB is defined as the dividing line between barely perceptible and distinctly perceptible (FTA 2018). Therefore, it is expected that the existing ground-borne vibration levels at the project vicinity would be below the perceptible level.

5 REGULATORY SETTING

Federal, state, and local agencies have set noise and ground-borne vibration regulations and policies to protect the health and welfare of the public, as described below.

5.1 Federal

There are no federal noise or ground-borne vibration standards or regulations that directly regulate environmental noise related to the construction or operation of the proposed project.

5.2 State

The State of California has not adopted statewide regulations or standards for noise. However, the *State of California General Plan Guidelines*, published and updated by the Governor's Office of Planning and Research (OPR), provides standards and the acceptable noise categories for different land uses (OPR 2017). Figure 5 provides the exterior noise standards associated with the different land uses evaluated by the State.

California also requires each local government entity to perform noise studies and implement a noise element as part of its general plan. The purpose of the noise element is to limit the exposure of the community to excessive noise levels; the noise element must be used to guide decisions concerning land use.

There are no state ground-borne vibration standards that directly apply to the project.

5.3 County of Los Angeles

5.3.1 County of Los Angeles Noise Control Ordinance

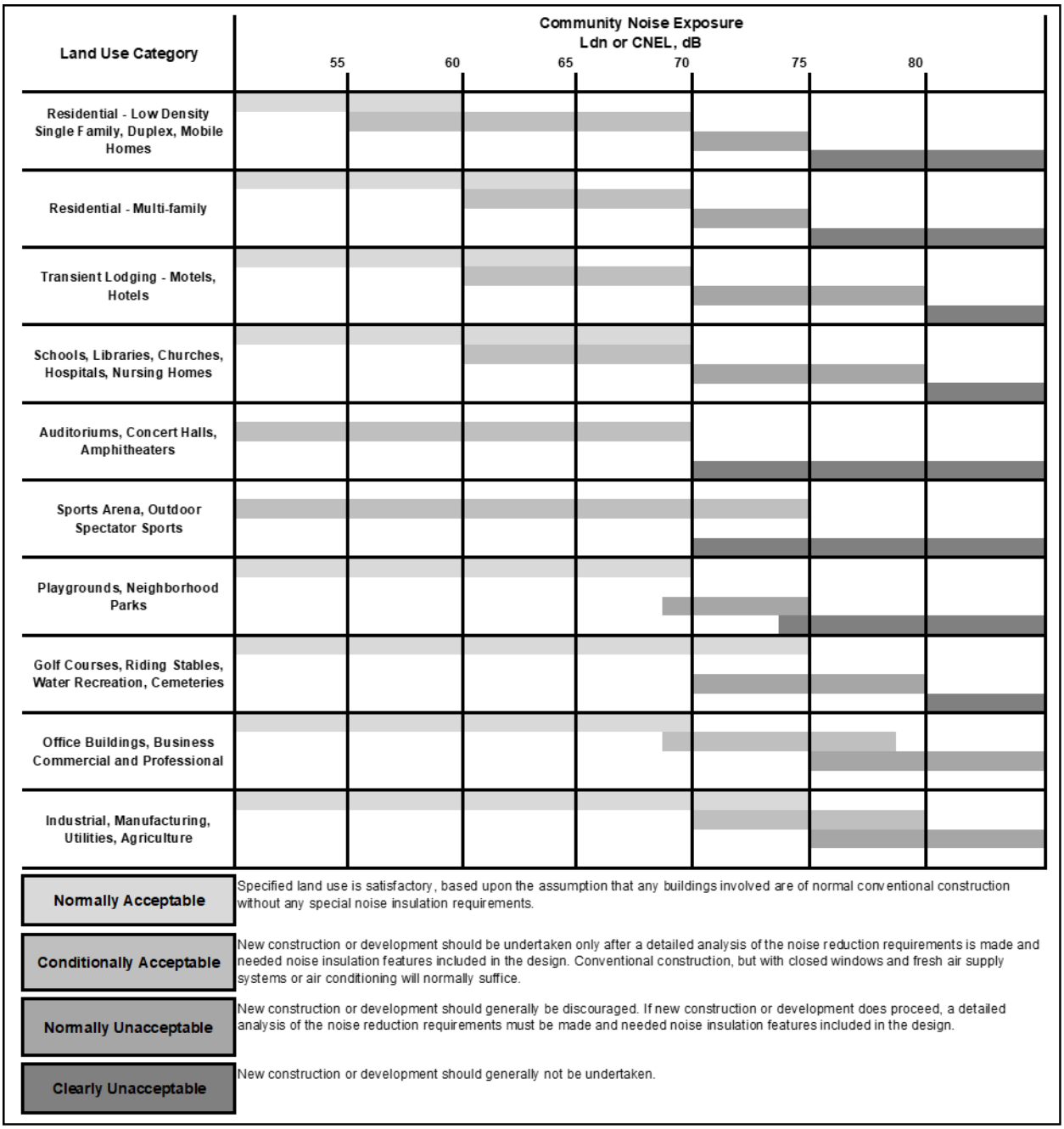
NOISE

The County of Los Angeles Noise Control Ordinance (Section 12.08 of the Los Angeles County Code [County Code]) identifies noise standards for exterior noise sources (Table 14). Regarding maximum exterior noise levels, County Code Section 12.08.390 states that exterior operational noise levels caused by fixed noise sources shall not exceed the levels listed in Table 14, or the existing ambient noise level, whichever is greater (measured in dB).

Table 14. County of Los Angeles Exterior Operational Noise Standards

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Exterior Noise Level (dB)
I	Noise-sensitive area	Anytime	45
II	Residential properties	10:00 p.m. to 7:00 a.m. (nighttime)	45
		7:00 a.m. to 10:00 p.m. (daytime)	50
III	Commercial properties	10:00 p.m. to 7:00 a.m. (nighttime)	55
		7:00 a.m. to 10:00 p.m. (daytime)	60
IV	Industrial properties	Anytime	70

Source: Los Angeles County Code 12.08.390 - Exterior noise standards.



Source: OPR (2017:Appendix D, Figure 2)

Figure 5. Land use compatibility for exterior community noise exposure.

Section 12.08.390 of the County Code also states that no person shall operate or cause to be operated, any source of sound at any location within the unincorporated county, or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person which causes the noise level, when measured on any other property either incorporated or unincorporated, to exceed any of the following exterior noise standards:

> **Standard No. 1** shall be the exterior noise level which may not be exceeded for a cumulative period of more than 30 minutes in any hour. Standard No. 1 shall be the applicable noise level; or, if the ambient noise level exceeded for 50% of the time of the measurement duration (L_{50}) exceeds the foregoing level, then the ambient L_{50} becomes the exterior noise level for Standard No. 1.
>
> **Standard No. 2** shall be the exterior noise level which may not be exceeded for a cumulative period of more than 15 minutes in any hour. Standard No. 2 shall be the applicable noise level plus 5 dB; or, if the ambient noise level exceeded for 25% of the time of the measurement duration (L_{25}) exceeds the foregoing level, then the ambient L_{25} becomes the exterior noise level for Standard No. 2.
>
> **Standard No. 3** shall be the exterior noise level which may not be exceeded for a cumulative period of more than 5 minutes in any hour. Standard No. 3 shall be the applicable noise level plus 20 dB; or, if the ambient noise level exceeded for 8.3% of the time of the measurement duration ($L_{8.3}$) exceeds the foregoing level, then the ambient $L_{8.3}$ becomes the exterior noise level for Standard No. 3.
>
> **Standard No. 4** shall be the exterior noise level which may not be exceeded for a cumulative period of more than 1 minute in any hour. Standard No. 4 shall be the applicable noise level plus 15 dB; or, if the ambient noise level exceeded for 1.7% of the time of the measurement duration ($L_{1.7}$) exceeds the foregoing level, then the ambient $L_{1.7}$ becomes the exterior noise level for Standard No. 4.
>
> **Standard No. 5** shall be the exterior noise level which may not be exceeded for any period of time. Standard No. 5 shall be the applicable noise level plus 20 dB; or, if the highest ambient noise level that occurred at the site (L_0) exceeds the foregoing level, then the ambient L_0 becomes the exterior noise level for Standard No. 5.

The County Noise Control Ordinance also identifies specific restrictions regarding construction noise. Construction noise limits are included in Chapter 12.08.440, Noise Control, of the Los Angeles County Code of Ordinances. Pursuant to the County Noise Control Ordinance, the operation of equipment used in construction, repair, alteration, drilling, or demolition work is prohibited between the hours of 7:00 p.m. and 7:00 a.m., Monday through Friday; before 8:00 a.m. or after 6:00 p.m. on Saturday; and anytime on Sundays or legal holidays if such noise would create a noise disturbance across a residential or commercial real-property line. Table 15 presents the maximum noise levels at the affected buildings allowed by the County Noise Control Ordinance.

Table 15. County of Los Angeles Construction Noise Limits

Time	Single-Family Residential	Multi-Family Residential	Semi-Residential/ Commercial
At Residential Structures			
Mobile Equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment:			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 8:00 p.m. to 7:00 a.m., and all day Sunday and legal holidays	60 dBA	64 dBA	70 dBA
Stationary Equipment. Maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment:			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA
At Business Structures			
Mobile Equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment:			
Daily, including Sundays and legal holidays, all hours		85 dBA (All structures)	

Source: Los Angeles County Code 12.08.440 - Construction noise.

dBA = A-weighted decibel(s)

5.3.1.2 VIBRATION

Section 12.08.560 of the County Noise Control Ordinance provides a ground-borne vibration limit as to not exceed the vibration human perception threshold of 0.01 inch per second (80 VdB).

As noted above, no standards or limits applicable to potential building damage from ground-borne vibration have been adopted by a local, state, or federal agency. Therefore, FTA available guidelines are used to assess potential impacts on buildings and structures due to ground-borne vibration. The FTA's *Transit Noise and Vibration Impacts Assessment Manual* provides impact criteria concerning building damage during construction activities (FTA 2018). Table 16 includes the FTA vibration criteria applicable to construction activities.

Table 16. Construction Vibration Impact Criteria for Building Damage

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: FTA (2018)

PPV = peak particle velocity; in/sec = inch(es) per second

5.4 City of Los Angeles

While the project site is located within the city of Los Angeles, it is owned by the County and is proposed for uses that benefit the public. Accordingly, the project is subject to the regulatory controls of the County of Los Angeles and not the City of Los Angeles. Nonetheless, the policy and regulatory documents of the City of Los Angeles that are most relevant to the project are provided herein for informational purposes.

5.4.1 Noise Element of the City of Los Angeles General Plan

The *Noise Element of the City of Los Angeles General Plan* (City of Los Angeles 1999) addresses noise sources and noise mitigation strategies and regulations and provides objectives and policies that ensure that noise from various sources does not create an unacceptable noise environment. The goal, objectives, and policies of the Noise Element that are relevant to the project are provided below for informational purposes and are used to inform the criteria by which the noise impacts of the proposed La Brea Tar Pits Master Plan is considered.

Goal – A city where noise does not reduce the quality of urban life.

Objectives and Policies –

> ***Objective 2 (Non-airport) -*** Reduce or eliminate non-airport-related intrusive noise, especially relative to noise sensitive uses.
>
> > ***Policy 2.2.*** Enforce and/or implement applicable city, state, and federal regulations intended to mitigate proposed noise-producing activities, reduce intrusive noise, and alleviate noise that is deemed a public nuisance.
>
> ***Objective 3 (Land Use Development) -*** Reduce or eliminate noise impacts associated with proposed development of land and changes in land use.
>
> > ***Policy 3.1.*** *Develop land use policies and programs that will reduce or eliminate potential and existing noise impacts.*

The City of Los Angeles's (City's) noise compatibility guidelines are based on the State's *General Plan Guidelines* (OPR 2017; see Figure 5).

5.4.2 City of Los Angeles Municipal Code

Section 41.40(a) of the Los Angeles Municipal Code (LAMC) prohibits the use, operation, repair, or servicing of construction equipment, as well as job-site delivery of construction materials, between the hours of 9:00 p.m. and 7:00 a.m., where such activities would disturb "persons occupying sleeping quarters in any dwelling hotel or apartment or other place of residence." In addition, Section 41.40(c) prohibits construction, grading, and related job-site deliveries on or within 500 feet of land developed with residential structures before 8:00 a.m. or after 6:00 p.m. on any Saturday or national holiday or at any time on Sunday.

Furthermore, Section 112.05 of the LAMC places a noise level limit of 75 dBA at 50 feet for powered equipment or tools, which includes construction equipment in, or within 500 feet of, any residential zone between the hours of 7:00 a.m. and 10:00 p.m. Under the code, such limits shall not apply where compliance is technically infeasible. Technical infeasibility means that the noise limit cannot be achieved

despite the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques during operation of the equipment.

Chapter XI of the LAMC (Noise Regulation) regulates noise from non-transportation noise sources such as commercial or industrial operations, mechanical equipment, or residential activities. These regulations do not apply to vehicles operating on public rights-of-way but do apply to noise generated by vehicles on private property, such as in parking lots or parking structures. The allowable noise levels are determined relative to the existing ambient noise levels at the affected location. Section 111.01(a) of the LAMC defines ambient noise as "the composite of noise from all sources near and far in a given environment, exclusive of occasional and transient intrusive noise sources and the particular noise source or sources to be measured. Ambient noise shall be averaged over a period of at least 15 minutes."

The Noise Regulation indicates that in cases where the actual ambient conditions are not measured, the City's presumed daytime and nighttime ambient noise levels, as defined in the LAMC Section 111.03 and provided in Table 17, should be used.

Table 17. City of Los Angeles Presumed Ambient Noise Levels

Zone	Daytime (7:00 a.m. to 10:00 p.m.), L_{eq}	Nighttime (10:00 p.m. to 7:00 a.m.), L_{eq}
	dBA	dBA
Residential, school, hospitals, hotels	50	40
Commercial	60	55
Manufacturing (M1, MR1, MR2)	60	55
Heavy manufacturing (M2, M3)	65	65

Source: City of Los Angeles Municipal Code, Section 111.03
L_{eq} = equivalent noise level

Section 111.02 states that under conditions where noise alleged to be offending occurs for more than 5 minutes but less than 15 minutes in any 1-hour period between the hours of 7:00 a.m. and 10:00 p.m. of any day, a 5-dBA allowance should be provided to the noise source. Additionally, under conditions where the offending noise occurs for 5 minutes or less in any 1-hour period between the hours of 7:00 a.m. and 10:00 p.m. of any day, an additional 5-dBA allowance can be provided to the noise source. Section 114.02 of the LAMC also provides noise regulations with respect to vehicle-related noise and prohibits the operation of any motor-driven vehicles upon any property within the city in a manner that would exceed the ambient noise level by more than 5 dBA.

5.4.3 City of Los Angeles CEQA Thresholds Guide

The *L.A. CEQA Thresholds Guide: Your Resource for Preparing CEQA Analyses in Los Angeles* (City of L.A. Thresholds Guide; City of Los Angeles 2006) is a guidance document that draws together practical information useful to City staff, project proponents, and the public involved in the environmental review of projects in the city of Los Angeles subject to CEQA.

The City of L.A. Thresholds Guide defines "noise sensitive" as residences, transient lodgings, schools, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, amphitheaters, playgrounds, and parks. The City of L.A. Thresholds Guide includes a set of criteria to evaluate project impacts. The significance thresholds assist in determining whether a project's impacts would be presumed significant under normal circumstances and, therefore, require mitigation to be identified.

A project under CEQA would normally have a significance impact on noise levels from construction if:

- Construction activities lasting more than 1 day would exceed existing ambient exterior noise levels by 10 dBA or more at a noise sensitive use;
- Construction activities lasting more than 10 days in a 3-month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise sensitive use; or
- Construction activities would exceed the ambient noise level by 5 dBA at a noise sensitive use between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturday, or at any time on Sunday.

A project would normally have a significant impact on noise levels from project operations if the project causes the ambient noise level measured at the property line of affected uses to increase by 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, or any 5-dBA or greater noise increase (see Figure 5).

6 THRESHOLDS OF SIGNIFICANCE AND METHODOLOGY

The following sections provide the framework for the noise impacts analysis. In general, Appendix G of the State CEQA Guidelines was first consulted to guide the impact analysis. Further, the regulations of the City and the County were compared to determine the most appropriate guidance document for consideration of significant impacts. While the project site is located within the City of Los Angeles, it is owned by the County of Los Angeles and is proposed for uses that benefit the public. Accordingly, the project is not subject to the regulatory controls of the City of Los Angeles. However, the areas surrounding the project site are entirely within the jurisdiction of the City of Los Angeles. As such, the noise analysis was prepared in consideration of both City and County criteria and regulations, with the more restrictive provisions applied.

6.1 Thresholds of Significance

Consistent with the State CEQA Guidelines, Appendix G, the project would have a significant noise impact if it would result in any of the following conditions:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or
- Generation of excessive ground-borne vibration or ground-borne noise levels; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.

Because the project site is not located within an airport land use plan, within 2 miles of a public airport or public use airport, or within the vicinity of a private airstrip, the project would not expose project occupants to excessive airport-related noise. Therefore, impacts related to airport-related noise would not occur and are not evaluated any further in this report.

6.1.1 Short-term Construction Noise Criteria

The County Noise Control Ordinance (Section 12.08.440 of the County Code) identifies noise standards for construction activities. The County's construction noise limit is 65 dBA for multi-family residential uses and 85 dBA for business structures. Similarly, the LAMC limit for construction noise lasting more than 10 days is 5 dBA above ambient levels. The following significance criteria are applied to the project, as set forth in the LAMC, the City of L.A. Thresholds Guide, and the County of Los Angeles Ordinance, with the more restrictive provisions applied:

- Construction activities would exceed the ambient noise level by 5 dBA (L_{eq}) or more at a noise-sensitive use.

6.1.2 Short-term Construction Vibration Criteria

Because there are currently no local regulatory standards for ground-borne vibration that are applicable to the project, then, based on FTA impacts with respect to building damage (see Table 5), ground-borne vibration would be considered significant if

- ground-borne vibration levels from construction activities exceed 0.5 PPV at the nearest off-site reinforced-concrete, steel, or timber building; or
- ground-borne vibration levels from construction activities exceed 0.3 PPV at the nearest off-site engineered concrete building; or
- ground-borne vibration levels from construction activities exceed 0.2 PPV at the nearest off-site non-engineered timber and masonry building; or
- ground-borne vibration levels from construction activities exceed 0.12 PPV at buildings extremely susceptible to vibration damage (e.g., historic buildings).

With respect to human annoyance, Section 12.08.560 of the Los Angeles County Noise Control Ordinance presents a threshold of 0.01 inch per second (80 VdB). Therefore, construction vibration impacts associated with human perception would be significant if:

- ground-borne vibration levels from construction activities exceed 80 VdB at the off-site receptor.

6.1.3 Long-Term Operational Noise Criteria

Per Chapter XI of the LAMC, a noise level increase of 5 dBA over the ambient noise level at an adjacent property line is considered a noise violation for most operational noise sources. The Los Angeles County Noise Control Ordinance states that the exterior operational noise level caused by project-related on-site fixed sources shall not exceed the levels presented in Table 14 or the ambient noise level, whichever is greater. Therefore, project-related operational on-site (i.e., non-roadway) noise sources, such as outdoor building mechanical/electrical equipment, outdoor activities, or parking facilities, would be significant if

- operational on-site activities would exceed the ambient noise level by 5 dBA (L_{eq}) or more at a noise-sensitive use.

6.1.4 Traffic Noise Criteria

Relating to roadway noise, a 24-hour average noise level metric (i.e., dBA CNEL) was used to assess noise impacts associated with the project based on the City's land use/noise compatibility guidelines and the City of L.A. Thresholds Guide (City of Los Angeles 2006). An increase of 3 dBA CNEL at noise-sensitive uses with ambient noise levels within the "normally unacceptable" or "clearly unacceptable"

category (see Figure 5), or any 5-dBA or greater noise increase if the ambient noise level at the affected sensitive land use is within the "normally acceptable" or "conditionally acceptable" category, would be considered significant.

6.2 Methodology

This analysis focuses on the potential change in the existing noise levels due to implementation of the project. Noise and ground-borne vibration would result from both construction and operation of the project.

A combination of existing literature and application of accepted noise and ground-borne vibration prediction and propagation methodologies were used for estimating short-term construction, operation, and long-term non-transportation and transportation source noise levels, as well as for evaluating ground-borne vibration impacts.

Using the construction and operation assumptions provided for the project, potential noise and vibration levels were estimated using the methods described below.

6.2.1 Construction Noise

6.2.1.1 ON-SITE CONSTRUCTION NOISE

Construction-related noise was analyzed using data and modeling methodologies from the FHWA's Roadway Construction Noise Model (FHWA 2011). The Roadway Construction Noise Model is FHWA's national model for the prediction of construction noise. This software is based on actual sound level measurements from various equipment types taken during the Central Artery/Tunnel Project conducted in Boston, Massachusetts, during the early 1990s (FWHA 2011).

Estimates of noise from the construction of the project are based on a roster of the maximum amount of construction equipment used on a given day. Table 18 presents standard construction equipment and the associated noise level at 50 feet. The Roadway Construction Noise Model has noise levels for various types of equipment preprogrammed into the software; that is, the noise level associated with the equipment is typical for the equipment type and not based on any specific make or model.

The approximate noise generated by construction equipment to be used at the project site has been conservatively calculated based on an estimated project construction equipment roster anticipated to be used at the construction site, and not considering further attenuation due to atmospheric interference or intervening structures.

The equipment and activities on-site would vary throughout the project, depending on various stages of construction. The predicted noise from construction activity is presented as a worst-case (highest noise level) scenario, where it is assumed that all equipment is present and operating simultaneously on-site for each stage of construction.

To analyze the project's potential noise impacts, the average 1-hour L_{eq} construction noise level generated during each phase of construction was estimated at each analyzed receptor based on its distance to the construction phase activity.

Table 18. Noise Levels for Common Construction Equipment

Equipment Description	Typical Maximum Noise Levels at 50 Feet (dBA)
Auger drill rig	85
Backhoe	80
Chain saw	85
Compressor (air)	80
Concrete saw	90
Crane	85
Dozer	85
Drill rig truck	84
Drum mixer	80
Dump truck	84
Excavator	85
Flat-bed truck	84
Front-end loader	80
Generator	82
Grader	85
Impact pile driver	95
Jackhammer	85
Man lift	85
Paver	85
Pickup truck	55
Pneumatic tools	85
Pumps	77
Rock drill	85
Roller	85
Scraper	85
Tractor	84
Trencher	82
Vibratory concrete mixer	80
Vibratory pile driver	95
Welder/torch	73

Source: Roadway Construction Noise Model Software, Version 1.1 (FHWA 2011)

6.2.1.2 OFF-SITE CONSTRUCTION NOISE

Noise levels would be generated from construction-related traffic associated with worker trips and haul-truck trips on roadways. The analysis of roadway noise levels from the project's construction traffic was conducted using a proprietary traffic noise model (SoundPlan Essential v5.1), with calculations based on data and methodology from the FHWA Traffic Noise Model, Version 2.5 (FHWA 2004).

This model allows for calculating noise levels at specific distances from the roadway based on traffic volumes, average speeds, and site environmental conditions. This analysis assessed the highest daily worker and haul-truck trips during project construction based on the construction assumptions that were developed based on information provided by the Foundation.

SoundPlan Essential, using methodologies from the FHWA Traffic Noise Model, calculates the hourly Leq noise levels generated by construction-related traffic. Potential noise impacts were then determined by comparing the predicted noise levels along the project's haul routes.

6.2.2 Operational Noise

6.2.2.1 ON-SITE OPERATIONAL NOISE

On-site noise levels would be generated by stationary noise sources such as mechanical equipment (heating, ventilation, and air conditioning [HVAC] equipment, dry coolers, and emergency generators), the on-site parking lot, the two loading areas, waste compactors, and the outdoor areas.

Using noise level data from published sources, impacts from these on-site stationary noise sources are evaluated by estimating the noise levels that each noise source would generate at the nearest noise-sensitive receptors. The estimated noise level from each noise source considers the distance from source to receptor.

Regarding mechanical equipment, noise level data for the project's dry coolers, which would be located on each building's rooftop, and three emergency generators, which would be in the mechanical rooms on the ground-floor level of the Page Museum, the new museum building, and the support building, were obtained from the project's mechanical, electrical, and plumbing engineer. It was assumed that the HVAC equipment would be located in mechanical rooms within the project buildings and equipped with silencers to reduce noise levels. Therefore, the analysis of mechanical equipment noise for the project was only conducted for the rooftop dry coolers and emergency generators.

The project's on-site parking lot noise level was estimated using FTA's recommended methodology for stationary source general assessment, which uses the following equation to estimate noise levels for parking garages:

$$L_{eq(h)} = SEL_{ref} + 10\log(N_{autos}/1000) - 25\log(D/50) - 35.6$$

where $L_{eq(h)}$ is the hourly L_{eq} noise level at 50 feet, SEL_{ref} is the reference noise level for a stationary noise source represented in sound exposure level at 50 feet from the noise source, N_{autos} is the number of automobiles per hour, and D is the distance from the parking garage to the sensitive receptor. The FTA cites an SEL_{ref} of 92 dBA for a parking garage with 1,000 cars during the peak activity hour (FTA 2018).

For the project's loading area, which would be used by delivery vehicles serving the project, sound levels from similar projects were used to estimate the noise levels at the nearest off-site sensitive receptors (County of Los Angeles 2017).Similarly, waste compactor noise ratings were taken from Table C8 of the British Standard BS 5228-1:2009 (British Standards Institution 2014).

Use of outdoor areas (i.e., outdoor café and bar located on the center terrace on the west side of the Page Museum; Pit 91; and a shaded outdoor classroom) would consist primarily of people congregating and conversing in those areas. Published data on human speech noise levels was obtained for the estimation of noise levels based on assumptions of the number of people who are expected to gather in each of the project's outdoor amenity areas. The speech noise levels for people in various noise environments used for analysis in this report are shown in Table 19.

Table 19. Noise Levels for Human Speech

Voice Effort	Sound Levels (dBA L_{eq}) at 1 meter (3 feet)		
	Male	Female	Children
Casual	53	50	50
Normal	58	55	55
Raised	65	62	62
Loud	75	71	71
Shout	88	82	82

Sources: EPA (1977); Harris (1998)

Additionally, the outdoor café and bar would be equipped with an outdoor speaker system to provide ambient background music. For this analysis, the noise level generated from the outdoor speaker system is assumed to be equivalent to 75 dBA at a distance of 15 feet (4.5 meters).

6.2.2.2 OFF-SITE OPERATIONAL NOISE

Off-site roadway noise was analyzed using the FHWA Traffic Noise Model methodology and traffic data from the Traffic Study. To quantify the effects of the project, traffic noise was analyzed using four different scenarios: 1) Existing, 2) Existing Plus Project, 3) Future (2032) Without Project, and 4) Future (2032) With Project. The first two scenarios were used to analyze the direct traffic noise impacts of the project; scenarios 3 and 4 were used to analyze the future/cumulative impacts.

6.2.3 Ground-Borne Vibration

6.2.3.1 CONSTRUCTION GROUND-BORNE VIBRATION

Construction-related vibration resulting from the project was analyzed using data and modeling methodologies provided by the FTA analytical vibration prediction model (FTA 2018). This guidance manual provides typical vibration source levels for various types of construction equipment, as well as methods for estimating the propagation of ground-borne vibration over distance.

The following equation was used to estimate the change in PPV levels over distance:

$$PPV_{equipment} = PPV_{ref} \times (100/D_{rec})^n$$

Where: $PPV_{equipment}$ is the PPV at a receptor; PPV_{ref} is the reference PPV at 100 feet from the equipment; D_{rec} is the distance from the equipment to the receptor, in feet; and n is the attenuation rate through ground (the default suggested value for n is 1.1). The equation was used to estimate the PPV at each of the closest vibration-sensitive receptors based on the worst-case (closest) distance between each source and receptor.

Vibration emission levels (PPV_{ref}) used are from measurements from several projects, including the Central Artery/Tunnel Project in Boston and from several published sources, including the FTA manual (2018) and Dowding (1996).

6.2.3.2 OPERATIONAL GROUND-BORNE VIBRATION

The primary source of ground-borne vibration related to the proposed project's operation includes traffic and parking operations. Humans are not likely to perceive vehicular-induced ground vibration. Therefore, the proposed project's operation would not increase the current vibration levels in the vicinity of the project.

7 IMPACTS EVALUATION AND RECOMMENDED MITIGATION MEASURES

Consistent with the State CEQA Guidelines, Appendix G, the evaluation contained in this section considered whether the project would generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project that exceed the criteria established in the previous section and, similarly, whether the project would generate excessive ground-borne vibration or ground-borne noise levels. Mitigation measures are identified in the analysis where impacts of the project could exceed significance criteria.

7.1 Increases in Ambient Noise Levels

The following analysis considers whether the project would generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.

7.1.1 Construction Noise

Project construction would consist of different activities undertaken in phases through to the operation of the project. For this analysis, project construction has divided into six phases based on the types of equipment required and workload: 1) demolition; 2) site preparation; 3) grading; 4) building construction; 5) paving; and 6) architectural coating (see Table 2).

7.1.1.1 ON-SITE CONSTRUCTION NOISE

Construction activities associated with the project are anticipated to last approximately 4 years, with completion anticipated in 2027. During this time, temporary increases in noise levels in the project area are expected to occur due to the operation of various large construction equipment within the project site.

Table 20 shows the project's anticipated construction schedule and presents an estimate of the maximum number of pieces of equipment for each construction phase, and conservatively assumes equipment would be operating 8 hours per day, 6 days per week for each construction phase duration.

The highest construction noise levels at each of the analyzed monitoring locations were estimated based on the reference noise levels shown in Table 21 and the distance of each analyzed monitor from the project's construction activities. To more accurately characterize the noise associated with each construction phase, a usage factor for each type of equipment was used to represent those periods when equipment is not operating under full-power conditions. Additionally, the noise levels were estimated to present a conservative impact analysis, assuming all pieces of equipment operate simultaneously. Furthermore, the model assumes that construction noise is constant when, in reality, construction activities are periodic and change throughout the day.

Table 20. Construction Anticipated Schedule, Trips, and Equipment

Phase (Duration)	Equipment Used			Daily Vehicle Trips
	Type	Number	Hours/day	
Demolition (262 working days) 1/1/2024 – 10/31/2024 Approx.102,000 square feet demolished	Rubber-tired dozer	2	8	50 worker one-way trips 8 vendor one-way trips 4 haul one-way trip
	Excavators or Jackhammer	3	8	
	Concrete/industrial saw	1	8	
Site Preparation (262 working days) 1/1/2024 – 10/31/2024	Rubber-tired dozers	3	8	20 worker one-way trips
	Tractors/loaders/backhoe	4	8	
Grading (52 working days) 11/1/2024 – 12/31/2024	Graders	1	8	75 worker one-way trips 10 vendor one-way trips 107 haul one-way trips
	Excavators or Jackhammer	2	8	
	Tractors/loaders/backhoe	2	8	
	Scrapers	2	8	
	Rubber-tired dozers	1	8	
Building Construction (755 working days) 1/1/2025 – 5/31/2027	Forklifts	3	8	200 worker one-way trips 17 vendor one-way trips 7 haul one-way trips
	Generator sets	1	8	
	Cranes	1	8	
	Welders	1	8	
	Tractors/loaders/backhoe	3	8	
Paving (184 working days) 6/1/2027 – 12/31/2027	Pavers	2	8	15 worker one-way trips 4 vendor one-way trips
	Paving equipment	2	8	
	Rollers	2	8	
Architectural Coating (79 working days) 7/1/2026 – 9/30/2026	Air compressor	1	6	20 worker one-way trips

Table 21. Estimated Construction Noise Levels at Nearby Sensitive Receptors

Receptor	Measured Daytime Ambient Noise Levels, L_{eq}	Estimated Construction Noise Levels by Construction Phases (Ambient plus Construction), L_{eq}						Significance Threshold, L_{eq}*
		Demolition	Site Preparation	Grading	Building Const.	Paving	Arch. Coating	
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
ST2	67.5	68.8	69.2	70.5	67.8	67.5	67.6	72.5
ST3	65.5	67.2	**70.8**	**73.2**	66.6	65.7	65.8	70.5
ST5	74.9	75.2	75.4	75.8	75.0	75.0	74.9	79.9
ST6	62.8	**68.8**	**70.0**	**72.4**	65.9	64	63.4	67.8
ST7	64.8	68.3	**71.2**	**73.7**	65.9	65.1	65	69.8
ST8	69.8	70.9	71.4	72.5	70.0	69.8	69.8	74.8
ST9	74.6	75.1	75.4	76.0	74.7	74.6	74.6	79.6
ST10	67.1	67.7	67.6	68.0	67.3	67.1	67.1	72.1

Note: Values in **bold** exceed the significance threshold for that receptor.

* Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

As discussed in Section 6.1.1, the corresponding significance criterion used in this construction noise analysis is an increase in the ambient noise level (L_{eq}) of 5 dBA at the noise-sensitive use. The estimated construction noise levels that would be experienced by the nearby sensitive receptors are shown in Table 21. Detailed calculations are provided in Appendix B.

As shown in Table 21, the highest estimated construction-related noise levels that could result at nearby sensitive receptors throughout the project's construction period would range from 68.0 dBA L_{eq} at sensitive receptor ST10 to 76.0 dBA L_{eq} at sensitive receptor ST9. All analyzed sensitive receptors near the project site would not be exposed to construction only noise levels exceeding 75 dBA L_{eq}. The exceedance of the significance thresholds would occur during the demolition, site preparation, and grading phases. As indicated in Table 21, the estimated construction noise levels at off-site receptors ST2, ST5, ST8, ST9, and ST10 would be below the significance threshold. At receptors ST3, ST6, and ST7, the estimated noise levels would exceed the significance threshold by 2.7 dBA at ST3, 4.6 at ST6, and 3.9 dBA at ST7. Therefore, without employing mitigation, noise impacts associated with the construction activities for the project would be significant.

The project would have a significant short-term and temporary impact on residential uses located to the north and east of the project site (see Table 21). Therefore, mitigation measures are proposed to minimize the impact of construction noise on these sensitive noise receptors. Mitigation measures would require construction of temporary and impermeable 12-foot-high temporary barriers designed to reduce noise by 10 dBA, or more, along the north and the east boundary between the project site and off-site receptor locations north and east of the project site. The noise reduction provided by the noise barrier would reduce construction-related noise to less than the significance threshold at the off-site sensitive uses. Consequently, construction noise impacts would be mitigated to less than significant.

Potential impacts would be reduced below the applicable threshold(s) with implementation of Mitigation Measure NOI-1 (Table 22). Therefore, potential impacts related to on-site construction noise would be less than significant with mitigation.

Table 22. Estimated Construction Noise Levels at Nearby Sensitive Receptors after Mitigation

Receptor	Measured Daytime Ambient Noise Levels, L_{eq}	Estimated Construction Noise Levels by Construction Phases (Ambient plus Construction), L_{eq} †						Significance Threshold, L_{eq}*
		Demolition	Site Preparation	Grading	Building Const.	Paving	Arch. Coating	
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
ST2	67.5	67.6	67.7	67.9	67.5	67.5	67.5	72.5
ST3	65.5	65.7	66.4	67.2	65.6	65.5	65.5	70.5
ST5	74.9	74.9	75.0	75.0	74.9	74.9	74.9	79.9
ST6	62.8	63.9	64.3	65.4	63.2	62.9	62.9	67.8
ST7	64.8	65.7	66.1	67.0	64.9	64.8	64.8	69.8
ST8	69.8	70.9	71.4	72.5	70.0	69.9	69.8	74.8
ST9	74.6	75.1	75.4	76.0	74.7	74.6	74.6	79.6
ST10	67.1	67.7	67.6	68.0	67.3	67.1	67.1	72.1

* Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

† Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

7.1.1.2 OFF-SITE CONSTRUCTION NOISE

Worker vehicles and haul trucks transporting equipment and materials to and from the project site during construction would increase noise levels on the local roads in the project area. It is expected that construction trucks would typically access the project site from the nearby Interstate (I-) 10, taking the La Brea Avenue exit from the westbound I-10. Trucks would travel northbound to Wilshire Boulevard, continue westbound on Wilshire Boulevard, then northbound on Curson Avenue to the project site. The construction worker vehicles would not be restricted to travel exclusively on this haul route and instead are allowed to access the project site via other routes. However, to perform a conservative traffic noise analysis, all traffic for the project (i.e., worker and truck trips) is assumed to travel on this haul route.

The grading phase would be the peak period of construction with the highest number of construction trucks. There would be a maximum of 127 construction trucks (e.g., vendor, hauling), totaling 254 trips per day. The hourly truck trips were estimated based on 8-hour workdays and assuming a uniform distribution of trips. The hourly worker trips were also estimated, assuming half of the workers would arrive in 1 hour, resulting in 38 worker trips per hour.

The estimated roadway noise levels resulting from the addition of the project's construction-related traffic on these roadway segments are shown in Table 23. Detailed calculations are provided in Appendix B.

Table 23. Off-Site Construction Traffic Noise Levels

Construction Phase	Estimated Number of Trips per Hour					Estimated Off-Site Construction Noise Levels along the Project Haul Routes, L_{eq}
						Wilshire Boulevard, La Brea Avenue, Curson Avenue
	Worker*	Vendor†	Hauling†	On-Site Trucks†	Total	dBA
Demolition	25.0	2.0	2.0	1.0	**30.0**	57.1
Site preparation	10.0	0.0	0.0	1.0	**11.0**	51.4
Grading	38.0	3.0	27.0	1.0	**69.0**	64.5
Building construction	100.0	5.0	0.0	1.0	**106.0**	59.6
Paving	8.0	1.0	0.0	1.0	**10.0**	52.8
Architectural coating	10.0	0.0	0.0	1.0	**11.0**	55.9
Existing ambient noise levels along the project haul routes, L_{eq}‡						72.4 / 73.3 / 68.6
Significance threshold, L_{eq}§						68.6

* Worker trips are based on half the total trips per day.

† The number of hourly trips is based on an hourly average, assuming a uniform distribution of trips over an 8-hour workday.

‡ La Brea Avenue noise levels were taken from County of Los Angeles (2017:Table IV.I-14).

§ Significance thresholds are equivalent to the existing daytime noise levels.

As shown in Table 23, the estimated noise levels generated by construction off-site traffic would be below the existing daytime ambient noise level at the noise sensitive receptors along the haul routes. Therefore, potential noise impacts from off-site construction traffic would be less than significant.

7.1.2 Operational Noise

Once operational, the project would establish stationary on-site noise sources at the project site as well as contribute to off-site roadway traffic noise. New stationary noise sources would include the parking facilities, mechanical equipment (i.e., dry coolers and emergency generators), loading and waste compacting activities, and activities associated with the use of outdoor spaces (e.g., outdoor café and bar located on the center terrace on the west side of the Page Museum; and Pit 91 outdoor classroom), and roadway traffic noise sources.

7.1.2.1 ON-SITE STATIONARY NOISE SOURCES

7.1.2.1.1 Mechanical Equipment

As part of the project, noise-generating mechanical equipment at the project site would include numerous HVAC equipment located in mechanical rooms throughout the Page Museum building, the new museum building, and the support building, rooftop dry coolers, and emergency generators. All mechanical rooms within the project buildings would be outfitted with sound attenuation measures to reduce noise levels at neighboring properties. The mechanical equipment that may be audible at nearby sensitive receptors would be the dry coolers (located on the rooftops of the buildings) and three emergency generators (located on the ground floor of each building).

Noise from the rooftop dry coolers would be generated when the equipment is operating throughout the day. A reference noise level of 73 dBA at 3 feet was assumed for a 5-ton dry cooler unit.[2] Detailed calculations along the number and rating of the mechanical noise sources are provided in Appendix C.

The three generators on the ground floor of the project buildings would be operated periodically for testing and maintenance in addition to times of electrical power failure at the project site. It was assumed that only one of the generators would be operating at a given hour. A rating of 86 dBA at 50 feet was assumed for the generators.

Table 24 presents the estimated noise levels at the evaluated off-site receptors from the operation of the proposed mechanical noise sources.

As shown in Table 24, the estimated noise levels from the operation of the mechanical equipment would range between 47.3 dBA L_{eq} at receptor ST10 to 59.2 dBA L_{eq} at receptor ST3. Additionally, all the estimated noise levels from mechanical equipment plus existing ambient would be below the existing daytime ambient noise levels plus 5 dBA. Thus, the operation of the project's mechanical noise sources would not generate substantial noise level increases at nearby off-site sensitive uses. Therefore, this impact would be less than significant.

[2] Lennox ML14XC1 Air conditioner MERIT Series.

Table 24. Estimated Noise Levels from Mechanical Equipment

Off-Site Receptor	Existing Daytime Ambient Noise Levels, L_{eq}	Estimated Noise Levels from Mechanical Equipment, L_{eq}	Ambient plus Project Noise Levels, L_{eq}	Significance Threshold*
	dBA	dBA	dBA	dBA
ST2	67.5	50.1	67.6	72.5
ST3	65.5	59.2	66.4	70.5
ST5	74.9	53.1	74.9	79.9
ST6	62.8	57.2	63.9	67.8
ST7	64.8	56.4	65.4	69.8
ST8	69.8	52.1	69.9	74.8
ST9	74.6	52.0	74.6	79.6
ST10	67.1	47.3	67.1	72.1

* Significance thresholds are assumed to be equal to the measured daytime noise levels plus 5 dBA.

7.1.2.1.2 Parking Noise

The existing parking lot would be expanded from 63,000 square feet to 65,000 square feet and shifted to the northeast corner of the site. The parking lot would hold approximately 170 vehicle parking spaces, an increase of approximately 15 spaces. Sources of noise within the parking lot would primarily include car movements, doors opening and closing, people talking, and car alarms.

Based on the peak-hour traffic volumes presented in the Traffic Study prepared for the project, vehicles traveling into and out of the project site would result in approximately 85 morning peak hour, 122 midday peak hour, and 34 afternoon peak hour trips at the project's driveways on Curson Avenue and 6th Street. For the purposes of this analysis, the midday peak-hour traffic volumes were used to estimate noise levels generated at the parking lot, as they are higher than the traffic volumes for the morning and afternoon. peak hours. Therefore, approximately 0.72 movements per hour per parking space were assumed to estimate noise levels at the analyzed receptors.

Table 25 presents the estimated noise levels from parking activities at the off-site sensitive receptors. As shown in Table 25, the estimated noise levels from the parking lot operation would range between 24.5 dBA L_{eq} at receptor ST10 and 43.8 dBA L_{eq} at receptor ST6. Additionally, the estimated noise levels at all off-site locations would be below the project significance threshold (i.e., an increase of 5 dBA Leq over existing ambient noise levels). Thus, the project's parking lot operation would not generate substantial noise level increases at nearby off-site sensitive uses. Therefore, this impact would be less than significant.

Table 25. Estimated Noise Levels from Parking Activities

Off-Site Receptor	Existing Daytime Ambient Noise Levels, L_{eq}	Estimated Noise Levels from Parking Activities, L_{eq}	Ambient plus Project Noise Levels, L_{eq}	Significance Threshold*
	dBA	dBA	dBA	dBA
ST2	67.5	29.0	67.5	72.5
ST3	65.5	37.1	65.5	70.5
ST5	74.9	42.2	74.9	79.9
ST6	62.8	43.8	62.9	67.8
ST7	64.8	33.4	64.8	69.8
ST8	69.8	26.2	69.8	74.8
ST9	74.6	28.2	74.6	79.6
ST10	67.1	24.5	67.1	72.1

* Significance thresholds are assumed to be equal to the measured daytime noise levels plus 5 dBA.

7.1.2.1.3 Loading and Trash Compactor Activities

Two loading and service areas would accommodate deliveries for labs, exhibition material, food service, events, and staff offices. One of the loading areas would be located at the new museum building on the north side, and the second loading area would be located at the Page Museum, also on the north side. The project would include one waste compactor at each of the proposed loading areas.

For the project's loading area, which would be used by delivery vehicles serving the project, sound levels from similar projects were used to estimate the noise levels at the nearest off-site sensitive receptors. A noise level of 71 dBA L_{eq} at a distance of 50 feet was assumed to represent typical noise levels from loading dock facilities (County of Los Angeles 2017). In addition, a noise rating of 66 dBA L_{eq} at a distance of 50 feet was assumed to represent the waste compactor operations (British Standards Institution 2014:Table C8, Waste Compactor).

The estimated noise levels from the operation of the loading docks and the trash compactors would be below the existing ambient noise levels (Table 26). Therefore, potential noise impacts from loading and waste compactor operations would be less than significant. Detailed calculations are provided in Appendix C.

Table 26. Estimated Noise Levels from Loading and Trash Compactor Operations

Off-Site Receptor	Existing Daytime Ambient Noise Levels, L_{eq}	Estimated Noise Levels from Loading and Trash Compactor Operations, L_{eq}	Ambient plus Project Noise Levels, L_{eq}	Significance Threshold*
	dBA	dBA	dBA	dBA
ST2	67.5	48.8	67.6	72.5
ST3	65.5	54.4	65.8	70.5
ST5	74.9	57.2	75.0	79.9
ST6	62.8	59.2	64.4	67.8

Off-Site Receptor	Existing Daytime Ambient Noise Levels, L_{eq}	Estimated Noise Levels from Loading and Trash Compactor Operations, L_{eq}	Ambient plus Project Noise Levels, L_{eq}	Significance Threshold*
	dBA	dBA	dBA	dBA
ST7	64.8	55.1	65.2	69.8
ST8	69.8	51.9	69.9	74.8
ST9	74.6	52.3	74.6	79.6
ST10	67.1	48.1	67.2	72.1

* Significance thresholds are assumed to be equal to the measured daytime noise levels plus 5 dBA.

7.1.2.1.4 Outdoor Areas

Outdoor areas (e.g., outdoor café and bar located on the center terrace on the west side of the Page Museum; and Pit 91 outdoor classroom) would consist primarily of people congregating and conversing in those areas. Pit 91 would continue to be a key research and interpretation destination in the park. The project would demolish the current viewing station overlooking Pit 91 and construct a shaded outdoor classroom with canopy (2,880 square feet). The second floor of the Page Museum would contain two classrooms and a multipurpose space. An outdoor café and bar would be located next to these spaces on the center terrace on the west side of the Page Museum (8,234 square feet).

To analyze the noise impacts from the use of outdoor spaces, the estimated total number of people is conservatively based on 15 square feet per person, based on the California Building Code's occupant load factor for assembly areas. For the noise analysis, it was estimated that up to 549 people could occupy the second floor of the Page Museum, and up to 192 people could occupy the Pit 91 outdoor classroom. A reference noise level of 65 dBA and 62 dBA L_{eq} at a distance of 3 feet (1 meter) was used to represent males and females speaking in a raised voice, respectively (Harris 1991). Additionally, it was assumed that up to 50 percent of the people would be talking at the same time.

An additional potential noise source associated with the use of the second floor of the Page Museum would be the use of an outdoor sound system. A reference value of 75 dBA L_{eq} at a distance of 15 feet (4.5 meters) was assumed for the operation of the outdoor sound system. In addition, the hours of operation for the use of the outdoor areas were assumed to be from 7:00 a.m. to 7:00 p.m., following the museum's hours of operation.

Table 27 presents the estimated noise levels resulting from the use of outdoor areas at the off-site sensitive receptors. Detailed calculations are provided in Appendix C. As shown in Table 27, the estimated noise levels at all analyzed receptors would not exceed the ambient noise levels plus 5 dBA L_{eq} threshold. Therefore, potential noise impacts from outdoor areas would be less than significant.

Table 27. Estimated Noise Levels from Outdoor Uses

Off-Site Receptor	Existing Daytime Ambient Noise Levels, L_{eq}	Estimated Noise Levels from Outdoor Uses, L_{eq}	Ambient plus Project Noise Levels, L_{eq}	Significance Threshold*
	dBA	dBA	dBA	dBA
ST2	67.5	42.7	67.5	72.5
ST3	65.5	46.9	65.6	70.5
ST5	74.9	47.9	74.9	79.9
ST6	62.8	51.8	63.1	67.8
ST7	64.8	50.7	65.0	69.8
ST8	69.8	46.4	69.8	74.8
ST9	74.6	46.7	74.6	79.6
ST10	67.1	42.0	67.1	72.1

* Significance thresholds are assumed to be equal to the measured daytime noise levels plus 5 dBA.

7.1.2.2 OFF-SITE TRAFFIC

7.1.2.2.1 Existing Plus Project

The project would generate new vehicle trips that would incrementally add to the existing traffic levels on surrounding streets and could result in an increase in the associated traffic noise levels. Based on the Traffic Study prepared for the project, it is estimated that the project would generate 12 morning peak hour trips, 306 midday peak hour trips, and 85 afternoon peak hour trips during the weekdays. Additionally, the Traffic Study estimates that the project would generate 284 midday peak hour trips during the weekend (Saturday). Overall, the project would generate an estimated 1,293 new trips during the weekdays and 1,679 net new trips during the weekend.

As discussed previously, while the Traffic Study did not directly analyze ADT on the roadway segments in the project site vicinity, the ADT volumes on these nearby roadway segments were estimated, based on the maximum daily peak hour trips on each roadway intersection presented in the Traffic Study. Detailed calculations are provided in Appendix C.

Table 28 presents the estimated off-site traffic noise impacts associated with Existing Plus Project conditions. As shown therein, the project would result in a maximum CNEL increase of 0.3 dBA during a weekday, and an estimated increase of 0.4 dBA during the weekend, between 6th Street and Wilshire Boulevard. Therefore, the estimated off-site traffic noise level increase would be below the 3-dBA CNEL significance threshold based on the City's land use/noise compatibility guidelines and the City of L.A. Thresholds Guide, and the potential current off-site traffic noise impacts associated with the project would be less than significant.

7.1.2.2.2 Future Plus Project

The analysis of operational off-site traffic noise impacts above evaluated the increase in traffic noise levels attributable to the project based on existing conditions. Further analysis was prepared to determine the potential noise impacts associated with the project operation compared to the future noise conditions. Table 29 summarizes the estimated off-site traffic noise impacts associated with Future Plus Project conditions. Detailed calculations are provided in Appendix C. As shown therein, the project would result

in a maximum CNEL increase of 0.4 dBA during weekdays along the road segment between Fairfax Avenue and Ogden Drive, and an estimated increase of 0.4 dBA during the weekend between 6th Street and Wilshire Boulevard. Therefore, the estimated off-site traffic noise level increase would be below the City of L.A. Thresholds Guide, and the potential future off-site traffic noise impacts associated with the project would be less than significant.

Table 28. Traffic Noise Impacts – Existing Plus Project

Roadway Segment		Adjacent Land Use	Calculated Traffic Noise Levels, CNEL					
			Existing Without Project		Existing Plus Project		Increase Due to Project	
			Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
			dBA	dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Avenue and Ogden Drive	Residential	71.3	69.8	71.5	70.1	0.2	0.3
	Between Ogden Drive and Curson Avenue	Residential	71.7	67.7	71.7	67.7	0.0	0.0
	East of Curson Avenue	Residential	71.0	67.7	71.0	67.8	0.0	0.1
Ogden Drive	North of 6th Street	Residential	62.6	60.8	62.7	60.9	0.1	0.1
	South of Wilshire Boulevard	Commercial	62.9	60.8	63.0	61.0	0.1	0.2
Spaulding Avenue	South of Wilshire Boulevard	Commercial	64.9	63.2	65.0	63.4	0.1	0.2
Curson Avenue	North of 6th Street	Residential	67.3	64.8	67.4	64.9	0.1	0.1
	Between 6th Street and Wilshire Boulevard	Residential	68.1	67.6	68.4	68.0	0.3	0.4
	South of Wilshire Boulevard	Residential	71.0	69.1	71.1	69.3	0.1	0.2
Wilshire Boulevard	Between Fairfax Avenue and Ogden Drive	Museum	68.3	66.0	68.4	66.2	0.1	0.2
	Between Ogden Drive and Spaulding Avenue	Commercial	67.2	65.1	67.3	65.3	0.1	0.2
	Between Spaulding Avenue and Curson Avenue	Museum	69.4	67.0	69.5	67.2	0.1	0.2
	East of Curson Avenue	Commercial	67.8	65.8	67.9	65.9	0.1	0.1

Table 29. Traffic Noise Impacts – Future Plus Project

Roadway Segment		Adjacent Land Use	Calculated Traffic Noise Levels, CNEL					
			Future Without Project		Future Plus Project		Increase Due to Project	
			Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
			dBA	dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Avenue and Ogden Drive	Residential	71.5	70.3	71.5	70.5	0.0	0.2
	Between Ogden Drive and Curson Avenue	Residential	71.9	70.3	72.0	70.4	0.1	0.1
	East of Curson Avenue	Residential	71.2	68.4	71.2	68.4	0.0	0.0
Ogden Drive	North of 6th Street	Residential	63.0	61.8	63.3	61.9	0.3	0.1
	South of Wilshire Boulevard	Commercial	63.0	61.2	63.0	61.4	0.0	0.2
Spaulding Avenue	South of Wilshire Boulevard	Commercial	65.3	63.5	65.3	63.8	0.0	0.2
Curson Avenue	North of 6th Street	Residential	67.7	66.3	67.7	66.4	0.0	0.1
	Between 6th Street and Wilshire Boulevard	Residential	67.8	68.1	67.8	68.5	0.0	0.4
	South of Wilshire Boulevard	Residential	71.4	69.5	71.4	69.6	0.0	0.1
Wilshire Boulevard	Between Fairfax Avenue and Ogden Drive	Museum	62.8	66.3	63.2	66.5	0.4	0.2
	Between Ogden Drive and Spaulding Avenue	Commercial	67.6	65.5	67.6	65.8	0.0	0.2
	Between Spaulding Avenue and Curson Avenue	Museum	69.6	67.4	69.6	67.7	0.0	0.2
	East of Curson Avenue	Commercial	67.5	66.2	67.6	66.4	0.1	0.1

7.1.2.3 COMPOSITE NOISE LEVEL IMPACTS

In addition to considering the project's operational off-site and on-site noise generation, the composite noise levels (i.e., noise levels from all on-site and off-site noise sources combined) experienced by surrounding sensitive receptors due to the project's operational noise sources occurring concurrently with existing noise sources are also evaluated to assess the potential overall increase in ambient noise levels at the analyzed monitoring locations. These off-site monitoring locations would experience noise levels generated by the project's mechanical equipment, outdoor areas, parking facilities, off-site traffic, and loading operations in addition to ambient noise levels generated by surrounding land uses and roadways. The analysis of the composite operational noise levels in the project vicinity was evaluated using the CNEL noise metric and is conducted using the following assumptions for each noise source:

- Mechanical Noise: Noise levels generated by the noise-generating mechanical equipment at the project site would occur continuously between 6:00 a.m. and 10:00 p.m.
- Parking Facility: Noise levels that would be generated at the project parking lot by peak-hour vehicle trips are assumed to occur continuously throughout the hours of 6:00 a.m. to 10:00 p.m.
- Outdoor Activities: Noise levels that would be generated at the outdoor areas are assumed to occur continuously throughout the hours of 7:00 a.m. to 7:00 p.m.
- Off-Site Traffic: Noise levels generated by off-site traffic are assumed to occur continuously for 24 hours per day.
- Loading Area/Waste Compactor: Noise levels generated by the project's loading areas and the waste compactors are assumed to occur for 3 hours between 7:00 a.m. to 10:00 p.m.

Table 30 presents the estimated composite noise levels in terms of CNEL at the off-site receptors.

Table 30. Composite Operational Noise Impacts

Off-Site Monitoring Location	Estimated Noise Levels								
	Existing Ambient	Off-Site Traffic	Mechanical	Parking	Trash Compactor and Loading	Outdoor Activities	Project Composite	Ambient plus Project	Increase
	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
ST2	68.1	52.9	51.3	30.2	46.0	39.7	55.8	68.3	0.2
ST3	66.4	43.9	60.4	38.3	51.6	43.9	61.1	67.5	1.1
ST5	75.1	50.8	54.3	43.4	54.4	44.9	58.5	75.2	0.1
ST6	64.4	54.1	58.4	45.0	56.4	48.8	61.7	66.3	1.9
ST7	65.9	54.7	57.6	34.6	52.3	47.7	60.4	67.0	1.1
ST8	70.2	54.7	53.3	27.4	49.1	43.4	57.8	70.4	0.2
ST9	74.8	53.9	53.2	29.4	49.5	43.7	57.5	74.9	0.1
ST10	67.8	52.3	48.5	25.7	45.3	39.0	54.5	68.0	0.2

As shown in Table 30, the project would have a maximum increase of 1.9 dBA CNEL (at receptor ST6) during project operation. Therefore, the composite noise levels due to the project operations would remain below the 3-dBA CNEL significance threshold set forth in the City of L.A. Thresholds Guide and the City's Noise Regulations for noise-sensitive uses within the "normally unacceptable" or "clearly unacceptable" category and the potential noise impacts due to project operations would be less than significant.

7.2 Ground-borne Vibration and Noise

The operation of heavy construction equipment at the project site would generate ground-borne vibration that could affect structures immediately adjacent to the project site or could also cause an annoyance to people at those locations.

Ground-borne vibration levels resulting from construction activities occurring within the project site were estimated using data published by the FTA (FTA 2018). Construction activities that would have the potential to generate levels of ground-borne vibration within the project site include mobile equipment activities, among others. Project vibration impacts were estimated using the vibration source level of construction equipment and the construction vibration assessment methodology published by the FTA.

Based on the reference vibration levels for the different pieces of equipment and the distances from the primary project construction activities, construction vibration velocity levels were estimated at the different receptors. The estimated vibration velocities were then compared against the building damage criteria in the FTA's *Transit Noise and Vibration Impacts Assessment Manual* (2018). Table 31 shows the estimated PPVs at the off-site receptors and the estimated vibration impacts on buildings.

Table 31. Construction Vibration Impacts – Building Damage

Off-Site Receptor	Building Category	Estimated Vibration Velocity Levels at the Off-Site Receptors (PPV)						Significance Threshold,
		Demolition	Site Preparation	Grading	Building Const.	Paving	Arch. Coating	
		in/sec	in/sec	in/sec	in/sec	in/sec	in/sec	in/sec
ST2	Non-engineered timber and masonry buildings	0.0051	0.0051	0.0051	0.0009	0.0016	0.0000	0.2
ST3	Non-engineered timber and masonry buildings	0.0021	0.0119	0.0119	0.0025	0.0038	0.0000	0.2
ST5	Non-engineered timber and masonry buildings	0.0029	0.0062	0.0062	0.0013	0.0095	0.0000	0.2
ST6	Engineered concrete and masonry buildings	0.0069	0.0107	0.0107	0.0025	0.0092	0.0000	0.3
ST7	Engineered concrete and masonry buildings	0.0070	0.0140	0.0140	0.0013	0.0043	0.0000	0.3
ST8	Engineered concrete and masonry buildings	0.0072	0.0072	0.0072	0.0006	0.0024	0.0000	0.3
ST9	Engineered concrete and masonry buildings	0.0088	0.0088	0.0088	0.0006	0.0025	0.0000	0.3

Off-Site Receptor	Building Category	Estimated Vibration Velocity Levels at the Off-Site Receptors (PPV)						Significance Threshold,
		Demolition	Site Preparation	Grading	Building Const.	Paving	Arch. Coating	
		in/sec	in/sec	in/sec	in/sec	in/sec	in/sec	in/sec
ST10	Engineered concrete and masonry buildings	0.0013	0.0013	0.0013	0.0006	0.0013	0.0000	0.3

* FTA construction vibration impact criteria for building damage (FTA 2018).

Table 32 shows the comparison between the estimated ground-vibration levels and the human annoyance threshold. Detailed calculation worksheets are included in Appendix D.

Table 32. Construction Vibration Impacts – Human Annoyance

Off-Site Receptor	Building Category	Estimated Vibration Velocity Levels at the Off-Site Receptors						Significance Threshold,
		Demolition	Site Preparation	Grading	Building Const.	Paving	Arch. Coating	
		VdB	VdB	VdB	VdB	VdB	VdB	VdB
ST2	Non-engineered timber and masonry buildings	62	62	62	47	52	0	80
ST3	Non-engineered timber and masonry buildings	54	69	69	56	60	0	80
ST5	Non-engineered timber and masonry buildings	57	64	64	50	68	0	80
ST6	Engineered concrete and masonry buildings	65	69	69	56	67	0	80
ST7	Engineered concrete and masonry buildings	65	71	71	51	61	0	80
ST8	Engineered concrete and masonry buildings	65	65	65	44	56	0	80
ST9	Engineered concrete and masonry buildings	67	67	67	44	56	0	80
ST10	Engineered concrete and masonry buildings	50	50	50	44	50	0	80

* FTA ground-borne vibration impact criteria for residences and buildings where people normally sleep for infrequent vibration events (FTA 2018).

As shown in Table 31 and Table 32, vibration levels generated by the construction equipment at the project site during project construction would not exceed the applicable vibration criteria for building damage or human annoyance at the surrounding structures. Therefore, impacts would be less than significant.

Groundborne noise refers to the rumbling noise resulting from the motion of building room surfaces as a result of the vibration of floors and walls; and it is only audible inside buildings. The link between groundborne vibration and groundborne noise depends on the vibration's frequency and the acoustical

absorption characteristics of the receiving room. The groundborne noise decibel level is lower for typical buildings than the groundborne vibration velocity level at low frequencies.

7.3 Cumulative Impacts

Cumulative noise or vibration impacts can occur when more than one project is under construction simultaneously or is expected to generate operational noise or vibration at the same time. The potential for cumulative noise impacts to occur is specific to the distance between the related projects and their stationary sources.

7.3.1 On-Site Construction Noise

Related projects in the vicinity of the proposed project considered in this analysis include construction activities that could occur simultaneously with the construction of the project consistent with the analysis performed in the Traffic Study. The following related projects were identified in the Traffic Study and are included in this analysis:

- LACMA renovation: This project is located at 5906 W. Wilshire Boulevard and shares the western half of the block with the proposed project. It proposes replacing four buildings within LACMA East collectively compromising 392,871 gsf. Overall, the project would result in a net decrease in the square footage of museum operations by approximately 5,371 square feet and a reduction in the maximum theater size from over 600 seats to 300 seats.
- Mixed-use project: This project is located at 5891 Olympic Boulevard and will consist of 46 apartments.
- Wilshire Curson project: This project is located at 5700–5780 Wilshire Boulevard / 712–752 S. Curson Avenue / 5721–5773 W. 8th Street / 715–761 S. Masselin Avenue. It is currently developed with two, six-story primarily office buildings comprising 1,002,990 square feet of floor area. The project would retain and renovate the southern portion of the existing buildings and would demolish the northern portion of the two existing office buildings for the addition of approximately 1,923,837 square feet of new floor area, consisting of 1,806,237 square feet of office uses and 117,600 square feet of ground floor commercial space. Upon completion, the project would result in a net lot area of 390,092 square feet (8.9 acres) within the project site, with a total floor area of approximately 2,340,552 square feet composed of 2,222,952 square feet of office floor area and 117,600 square feet of commercial floor area with a floor area ratio of 6:1.
- Mixed-use residential project: This project is located at 800 S. Fairfax Avenue. The site currently contains 40 apartments and an existing 3,829-square-foot restaurant/lounge. The restaurant/ lounge will remain, but the existing residential buildings will be replaced with 181 apartments, 28 affordable apartments, and 2,653 square feet of restaurant.
- Mixed-use residential and commercial development: This project is located at 5411 Wilshire Boulevard. It consists of the construction of a new 42-story mixed-use tower including up to 348 dwelling units and approximately 10,176 square feet of ground-floor commercial uses. Thirty-eight of the dwelling units would be restricted affordable. The project would demolish approximately 38,545 square feet of existing commercial uses.
- Olympic + Fairfax mixed-use project: This project is located at 6052–6066 W. Olympic Boulevard. It includes construction of a six-story, mixed-use building containing approximately 5,135 square feet of commercial retail space, 108 apartments, and 12 affordable apartments. It would replace 11,440 square feet of commercial retail uses.

- Mixed-use project: This project is located at 6300 W. 3rd Street. It includes demolition of over 150,000 square feet of commercial uses and construction of an eight-story, mixed-use building consisting of 83,994 square feet of commercial space and 331 dwelling units.
- San Vicente medical/commercial project: This project is located at 650–676 S. San Vicente Boulevard. The project proposes 140,305 square feet of medical office space, 4,000 square feet of restaurant/retail space, and 1,000 square feet for other commercial uses, such as a pharmacy. This will include the demolition of an existing 5,738 square-foot, vacant educational building and an 8,225-square-foot Big 5 Sporting Goods store.
- Olympic Boulevard mixed-use project: This project is located at 6001–6011 W. Olympic Boulevard. The proposed project includes the construction of a mixed-use building with 1,596 square feet of ground-floor retail, 51 apartments, and six affordable apartments. It includes the demolition of 8,488 square feet of retail and six apartments.

The construction-related noise levels from the related projects can be considered transient and intermittent. Further, it is assumed that the projects within the incorporated area of the City of Los Angeles would be required to comply with the City's Noise Ordinance No. 144,331 and No. 161,574. In addition, each of the related projects would be subject to Section 41.40 of the LAMC, which limits the hours of allowable construction activities, and Section 112.05 of the LAMC, which prohibits any powered equipment or powered hand tool from producing noise levels that exceed 75 dBA at a distance of 50 feet from the noise source within 500 feet of a residential zone. Noise resulting from cumulative construction activities would be reduced to the extent reasonably and technically feasible through mitigation measures proposed for each project and compliance with locally enforced noise ordinances.

As previously discussed in Section 7.1.1, construction noise levels for the project could exceed existing ambient noise levels by more than 5 dBA. However, as shown in Table 22, on-site construction noise levels for the project would be reduced to less-than-significant levels after mitigation. Therefore, with the related projects also complying with City requirements regarding construction noise impacts, the proposed project construction-related noise would have a less-than-significant cumulative impact.

7.3.2 Off-Site Construction Noise

In addition to the cumulative impacts of on-site construction activities, off-site construction trucks and worker trucks for the project would potentially result in cumulative impacts if the trucks for the related projects use the same haul route. As discussed above, the primary haul routes include Wilshire Boulevard and La Brea Avenue. A basic review of the related projects indicates that the same route would be used during construction. The analysis of the estimated off-site noise levels from project construction (see Section 7.1.1.2) indicated that noise levels along the haul route would be below the estimated ambient levels by a minimum of 4.1 dBA. To exceed the ambient noise levels, the total truck trips would need to increase by an approximate factor of 2.6 (i.e., increase from 69 trips per hour to 179 trips per hour). Based on the proposed project's limited contribution of construction traffic trips and the limited number of anticipated future development projects that would use the same or a similar haul route, traffic associated with the construction of the project and other related projects would not cumulatively add up to 179 or more hourly trips along Wilshire Boulevard and La Brea Avenue. Therefore, cumulative noise impacts from off-site construction are expected to be less than cumulatively significant.

7.3.3 On-Site Construction Vibration

Ground-borne vibration impacts due to construction activities are generally limited to buildings located close to the construction site. The closest related project is the LACMA renovation project, which is located adjacent to the project site. The *LACMA Building for the Permanent Collection Draft Environmental Impact Report* (County of Los Angeles 2017) indicates that the estimated vibration velocity levels (from all construction equipment) would be below the significance thresholds at all off-site building structures. Therefore, due to the rapid attenuation of the ground-borne vibration, there is no potential for a cumulative construction impact concerning ground-borne vibration.

7.3.4 Off-Site Construction Vibration

Based on FTA data, the vibration generated by a typical truck would be approximately 63VdB (0.006 PPV) at 50 feet (FTA 2018). The shortest distance between the haul route and the receptor is approximately 25 feet. Ground-borne vibration generated by a haul truck at this distance would be approximately 0.016 PPV, which is well below the most stringent building damage threshold of 0.12 PPV. Additionally, the estimated vibration levels along the haul route would be approximately 72 VdB, below the human annoyance threshold of 80 VdB. Trucks from related projects are expected to produce similar vibration levels as the project. Thus, the ground-borne vibration levels from haul trucks would be below the 0.12 PPV threshold. Therefore, potential cumulative vibration impacts from off-site construction would be less than significant.

7.3.5 On-Site Stationary Noise Sources

The LAMC limits stationary source noise from mechanical equipment; therefore, potential noise levels from these sources are expected to be less than significant for each related project. Furthermore, based on the distance of the related projects from the project site, cumulative stationary source noise impacts associated with the operation of the project and neighboring related projects would be less than significant.

7.3.6 Off-Site Mobile Noise Sources

Traffic volumes would be generated by the project and other related projects and would produce roadway noise. Cumulative noise impacts due to mobile sources were analyzed by comparing the projected increase in traffic noise levels from the Existing Conditions to Future Cumulative Conditions. The Future Cumulative Conditions scenario includes traffic volumes from future projects, future growth, and the proposed project. Table 33 presents the calculated traffic noise levels from Existing Conditions and Future Cumulative Plus Project Conditions.

Cumulative traffic volumes would result in a maximum increase of 2.5 dBA during a typical weekday, and 2.5 dBA during a typical weekend. Therefore, the cumulative noise impacts due to mobile (off-site) noise sources associated with the project, future growth, and related projects would be less than significant.

Table 33. Traffic Noise Impacts – Future Cumulative Plus Project

Roadway Segment		Adjacent Land Use	Calculated Traffic Noise Levels, CNEL					
			Existing Conditions		Cumulative Plus Project		Increase	
			Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
			dBA	dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Avenue and Ogden Drive	Residential	71.3	69.8	72.3	71.1	1.0	1.3
	Between Ogden Drive and Curson Avenue	Residential	71.7	67.7	72.5	69.4	0.8	1.7
	East of Curson Avenue	Residential	71.0	67.7	71.6	68.9	0.6	1.2
Ogden Drive	North of 6th Street	Residential	62.6	60.8	63.4	62.2	0.8	1.4
	South of Wilshire Boulevard	Commercial	62.9	60.8	64.2	62.1	1.3	1.3
Spaulding Avenue	South of Wilshire Boulevard	Commercial	64.9	63.2	66.2	64.4	1.3	1.2
Curson Avenue	North of 6th Street	Residential	67.3	64.8	68.3	66.8	1.0	2.0
	Between 6th Street and Wilshire Boulevard	Residential	68.1	67.6	70.6	70.1	2.5	2.5
	South of Wilshire Boulevard	Residential	71.0	69.1	72.6	70.7	1.6	1.6
Wilshire Boulevard	Between Fairfax Avenue and Ogden Drive	Museum	68.3	66.0	69.4	67.2	1.1	1.2
	Between Ogden Drive and Spaulding Avenue	Commercial	67.2	65.1	68.5	66.4	1.3	1.3
	Between Spaulding Avenue and Curson Avenue	Museum	69.4	67.0	70.6	68.3	1.2	1.3
	East of Curson Avenue	Commercial	67.8	65.8	69.2	67.4	1.4	1.6

7.4 Mitigation Measures

As discussed in detail in Section 7.1.1, project construction would have the potential to result in significant noise impacts at off-site sensitive receptors from on-site construction activities.

Mitigation Measure NOI-1: The following measures shall be implemented to reduce construction-related noise impacts:

- Operation of equipment used in construction, alteration, drilling, or demolition work shall be prohibited between the hours of 7:00 p.m. and 7:00 a.m., Monday through Friday; before 8:00 a.m. or after 6:00 p.m. on Saturday; and any time on Sundays or legal holidays.
- A temporary and impermeable 12-foot-high temporary barrier designed to provide a 10-dBA noise reduction, shall be erected along the eastern and northern sides of the project site boundary. This barrier shall be constructed in one of the following ways:
  - from acoustical blankets hung over or from a supporting frame, or
  - from commercially available acoustical panels lined with sound-absorbing material, or
  - from common construction materials such as plywood, provided that the barrier is designed with overlapping material at the seams to ensure that no gaps exist between the panels.
- Noise levels from powered equipment or powered hand tools at a distance of 50 feet from the noise source or within 500 feet of a residential zone will be limited to 75 dBA, such limits shall not apply where compliance is technically infeasible. Technical infeasibility means that the noise limit cannot be achieved despite the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques during operation of the equipment.
- All construction equipment shall be properly maintained per manufacturers' specifications and fitted with the best available noise-suppression devices.
- Pneumatic tools used at the site shall be equipped with an exhaust muffler on the compressed air exhaust to minimize noise levels.
- Stationary noise sources shall be located as far from adjacent sensitive receptors as possible and shall be muffled and enclosed within temporary sheds or insulated barriers when possible.
- Prior to commencement of construction, a designated project contact person will directly notify the management of any surrounding residential properties located within 100 feet of the project site about the construction schedule and activities and provide a contact number to address any noise-related complaints during construction.
- A designated point of contact shall be identified to address noise-related complaints during construction. The noise disturbance coordinator will be responsible for responding to any local complaints about construction noise.

Implementation of the above-described Mitigation Measure NOI-1 would minimize this impact to less than significant.

8 LITERATURE CITED

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APPENDIX A

Technician Field Sheets

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: **LT1**

Coordinates	Lat:	34.062993					
	Lon:	-118.355549					
	Elevation (ft):	176					
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831		
	S/N:	0011655		S/N:	76995		
Microphone	Model :	377B02	**File Name**		LT_LB1.001.s		
	S/N:	173681					
Monitoring	Start Time:	4/7/22 8:58 AM	**Calibrations**	Pre-Test:	4/7/22 8:52 AM	Deviation:	-0.01
	End Time:	4/9/22 8:09 AM		Post-Test:	4/9/22 8:09 AM		

Location Description
Northeast corner of the Lake Pit.

Parameter	LT_LB1.001.s										
	4/7/22 8:58 AM	4/9/22 8:09 AM									
Duration hh:mm		47:11:00									
LA_{eq}		56.9									
L_{dn}		60.6									
L_d		58.2									
L_n		53.0									
L_{den}		60.9									
L_d		58.9									
L_{eve}		54.2									
L_n		53.0									
$LA_{1.7}$		64.0									
$LA_{8.3}$		59.5									
LA_{10}		59.0									
LA_{25}		56.6									
LA_{50}		54.0									
LA_{90}		46.6									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	8:58	Traffic
			Construction
			Park visitors
			Landscaping equipment

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: LT2

Coordinates	Lat:	34.06456					
	Lon:	-118.358345					
	Elevation (ft):	173					
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831		
	S/N:	0011585		S/N:	46400		
Microphone	Model :	377B02	**File Name**		LT_LB2.003.s		
	S/N:	108355					
Monitoring	Start Time:	4/7/22 9:22 AM	**Calibrations**	Pre-Test:	4/7/22 9:20 AM	Deviation:	-0.07
	End Time:	4/9/22 8:35 AM		Post-Test:	4/9/22 8:36 AM		

Location Description
Northeast corner of Pit 13

Parameter	LT_LB2.003.s										
	4/7/22 9:22 AM	4/9/22 8:35 AM									
Duration hh:mm		47:13:32									
LA_{eq}		55.0									
L_{dn}		59.1									
L_d		56.2									
L_n		51.7									
L_{den}		59.5									
L_d		56.6									
L_{eve}		54.2									
L_n		51.7									
$LA_{1.7}$		62.0									
$LA_{8.3}$		57.5									
LA_{10}		57.0									
LA_{25}		54.8									
LA_{50}		52.4									
LA_{90}		46.0									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	9:20	Traffic
			Construction
			Park visitors
			Landscaping equipment

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: ST2

Coordinates	Lat:	34.064964					
	Lon:	-118.359104					
	Elevation (ft):	170					
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831		
	S/N:	0011655		S/N:	76995		
Microphone	Model :	377B02	**File Name**		LT_LB1.002.s		
	S/N:	173681					
Monitoring	Start Time:	4/9/22 9:28 AM	**Calibrations**	Pre-Test:	4/9/22 9:28 AM	Deviation:	0.04
	End Time:	4/9/22 9:43 AM		Post-Test:	4/9/22 9:44 AM		

Location Description
Multi-familiy residence on the north side of West 6th Street, northwest of the Project site.

Parameter	LT_LB1.002.s										
	4/9/22 9:28 AM	4/9/22 9:43 AM									
Duration hh:mm		0:15:01									
LA_{eq}		67.5									
L_{dn}		-									
L_d		67.5									
L_n		-									
L_{den}		-									
L_d		67.5									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		74.4									
$LA_{8.3}$		70.4									
LA_{10}		70.0									
LA_{25}		67.0									
LA_{50}		60.9									
LA_{90}		52.1									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	9-Apr	9:28	Traffic
			Construction
			Park visitors

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: ST3

Coordinates	Lat:	34.064973			
	Lon:	-118.357479			
	Elevation (ft):	176			
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831
	S/N:	0011655		S/N:	76995
Microphone	Model :	377B02	**File Name**		LT_LB1.003.s
	S/N:	173681			
Monitoring	Start Time:	4/9/22 9:51 AM	**Calibrations**	Pre-Test:	4/9/22 9:50 AM Deviation: 0.01
	End Time:	4/9/22 10:06 AM		Post-Test:	4/9/22 10:07 AM

Location Description
Multi-familiy residence on the north side of West 6th Street, northwest of the Project site.

Parameter	LT_LB1.003.s										
	4/9/22 9:51 AM	4/9/22 10:06 AM									
Duration hh:mm		0:15:02									
LA_{eq}		65.5									
L_{dn}		-									
L_d		65.5									
L_n		-									
L_{den}		-									
L_d		65.5									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		72.6									
$LA_{8.3}$		70.4									
LA_{10}		70.0									
LA_{25}		66.7									
LA_{50}		62.5									
LA_{90}		51.8									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	9-Apr	9:50	Traffic
			Construction
			Park visitors

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: ST5

Coordinates	Lat:	34.064983			
	Lon:	-118.354607			
	Elevation (ft):	181			
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831
	S/N:	0011588		S/N:	58540
Microphone	Model :	377B02	**File Name**		ST_LB.001.s
	S/N:	308845			
Monitoring	Start Time:	4/7/22 10:26 AM	**Calibrations**	Pre-Test:	4/7/22 10:24 AM Deviation: 0.05
	End Time:	4/7/22 10:41 AM		Post-Test:	4/7/22 10:42 AM

Location Description
Multi-familiy residence on the north side of West 6th Street, northeast of the Project site.

Parameter	ST_LB.001.s										
	4/7/22 10:26 AM	4/7/22 10:41 AM									
Duration hh:mm		0:15:01									
LA_{eq}		74.9									
L_{dn}		-									
L_d		74.9									
L_n		-									
L_{den}		-									
L_d		74.9									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		83.0									
$LA_{8.3}$		72.2									
LA_{10}		71.8									
LA_{25}		68.6									
LA_{50}		62.6									
LA_{90}		56.1									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	10:26	Traffic

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: ST6

Coordinates	Lat:	34.064148			
	Lon:	-118.354543			
	Elevation (ft):	182			
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831
	S/N:	0011588		S/N:	58540
Microphone	Model :	377B02	**File Name**		ST_LB.002.s
	S/N:	308845			
Monitoring	Start Time:	4/7/22 10:48 AM	**Calibrations**	Pre-Test:	4/7/22 10:47 AM Deviation: 0.03
	End Time:	4/7/22 11:03 AM		Post-Test:	4/7/22 11:04 AM

Location Description
Multi-familiy residence on the east side of Curson Avenue, east of the Project site.

Parameter	ST_LB.002.s										
	4/7/22 10:48 AM	4/7/22 11:03 AM									
Duration hh:mm		0:15:03									
LA_{eq}		62.8									
L_{dn}		-									
L_d		62.8									
L_n		-									
L_{den}		-									
L_d		62.8									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		70.7									
$LA_{8.3}$		67.4									
LA_{10}		66.8									
LA_{25}		63.2									
LA_{50}		59.1									
LA_{90}		51.5									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	10:48	Traffic
			Parking Lots

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: ST7

Coordinates	Lat:	34.063134			
	Lon:	-118.354546			
	Elevation (ft):	185			
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831
	S/N:	0011588		S/N:	58540
Microphone	Model :	377B02	**File Name**		ST_LB.003.s
	S/N:	308845			
Monitoring	Start Time:	4/7/22 11:09 AM	**Calibrations**	Pre-Test:	4/7/22 11:09 AM Deviation: -0.03
	End Time:	4/7/22 11:24 AM		Post-Test:	4/7/22 11:25 AM

Location Description
Mixed-use commercial building on the east side of Curson Avenue, east of the Project site.

Parameter	ST_LB.003.s										
	4/7/22 11:09 AM	4/7/22 11:24 AM									
Duration hh:mm		0:15:03									
LA_{eq}		64.8									
L_{dn}		-									
L_d		64.8									
L_n		-									
L_{den}		-									
L_d		64.8									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		74.0									
$LA_{8.3}$		66.5									
LA_{10}		66.0									
LA_{25}		63.6									
LA_{50}		60.0									
LA_{90}		54.6									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	11:09	Traffic
			Parking Lots

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: ST8

Coordinates	Lat:	34.06227					
	Lon:	-118.354891					
	Elevation (ft):	186					
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831		
	S/N:	0011588		S/N:	58540		
Microphone	Model :	377B02	**File Name**		ST_LB.004.s		
	S/N:	308845					
Monitoring	Start Time:	4/7/22 11:32 AM	**Calibrations**	Pre-Test:	4/7/22 11:31 AM	Deviation:	-0.04
	End Time:	4/7/22 11:47 AM		Post-Test:	4/7/22 11:48 AM		

Location Description
Office building on the south side of Wilshire Blvd, southeast of the Project site.

Parameter	ST_LB.004.s										
	4/7/22 11:32 AM	4/7/22 11:47 AM									
Duration hh:mm		0:15:05									
LA_{eq}		69.8									
L_{dn}		-									
L_d		69.8									
L_n		-									
L_{den}		-									
L_d		69.8									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		78.1									
$LA_{8.3}$		73.0									
LA_{10}		72.5									
LA_{25}		69.6									
LA_{50}		65.4									
LA_{90}		57.1									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	11:32	Traffic

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: ST9

Coordinates	Lat:	34.062328			
	Lon:	-118.356069			
	Elevation (ft):	182			
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831
	S/N:	0011588		S/N:	58540
Microphone	Model :	377B02	**File Name**		ST_LB.005.s
	S/N:	308845			
Monitoring	Start Time:	4/7/22 11:58 AM	**Calibrations**	Pre-Test:	4/7/22 11:56 AM Deviation: 0.17
	End Time:	4/7/22 12:13 PM		Post-Test:	4/7/22 12:16 PM

Location Description
Commercial building on the south side of Wilshire Blvd, south of the Project site.

Parameter	ST_LB.005.s										
	4/7/22 11:58 AM	4/7/22 12:13 PM									
Duration hh:mm		0:15:02									
LA_{eq}		74.6									
L_{dn}		-									
L_d		74.6									
L_n		-									
L_{den}		-									
L_d		74.6									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		81.3									
$LA_{8.3}$		79.0									
LA_{10}		78.7									
LA_{25}		76.0									
LA_{50}		71.7									
LA_{90}		63.7									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	11:58	Traffic
			Construction

La Brea Tar Pits Master Plan
Baseline Noise Survey

Location: **ST10**

Coordinates	Lat:	34.062551					
	Lon:	-118.358913					
	Elevation (ft):	164					
Sound Meter	Model :	LD 831	**Preamplifier**	Model :	PRM831		
	S/N:	0011588		S/N:	58540		
Microphone	Model :	377B02	**File Name**		ST_LB.006.s		
	S/N:	308845					
Monitoring	Start Time:	4/7/22 12:31 PM	**Calibrations**	Pre-Test:	4/7/22 12:30 PM	Deviation:	-0.34
	End Time:	4/7/22 12:46 PM		Post-Test:	4/7/22 1:02 PM		

Location Description
Commercial building on the south side of Wilshire Blvd, southwest of the Project site.

Parameter	ST_LB.006.s										
	4/7/22 12:31 PM	4/7/22 12:46 PM									
Duration hh:mm		0:15:08									
LA_{eq}		67.1									
L_{dn}		-									
L_d		67.1									
L_n		-									
L_{den}		-									
L_d		67.1									
L_{eve}		-									
L_n		-									
$LA_{1.7}$		75.4									
$LA_{8.3}$		70.5									
LA_{10}		69.9									
LA_{25}		67.5									
LA_{50}		63.4									
LA_{90}		54.7									

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
1	7-Apr	11:58	Traffic
			Construction

Baseline Noise Survey
Weather Data

34.094° N, 118.334° W

Station: Enrique Noguera Educational Ga

ID: KCALOSAN1004

Start date: 4/7/2022 **End date:** 4/9/2022

Day	Time	Temperature		Hourly Wind	Precipitation	Humidity	Daily max	Daily min
		F	C	mph	in	%	F	F
4/7/2022	0:00	65.15	18.4	0.0	0.00	66%	96.54	61.01
	1:00	65.11	18.4	0.0	0.00	65%		
	2:00	64.73	18.2	0.0	0.00	68%		
	3:00	61.80	16.6	0.0	0.00	76%		
	4:00	61.01	16.1	0.0	0.00	70%		
	5:00	61.07	16.1	0.0	0.00	54%		
	6:00	61.15	16.2	0.0	0.00	40%		
	7:00	66.61	19.2	0.0	0.00	33%		
	8:00	75.62	24.2	0.1	0.00	23%		
	9:00	84.80	29.3	0.1	0.00	19%		
	10:00	88.34	31.3	0.2	0.00	19%		
	11:00	91.49	33.1	0.3	0.00	17%		
	12:00	93.98	34.4	0.6	0.00	15%		
	13:00	96.54	35.9	1.3	0.00	14%		
	14:00	96.18	35.7	2.5	0.00	13%		
	15:00	96.22	35.7	2.6	0.00	12%		
	16:00	94.04	34.5	3.1	0.00	12%		
	17:00	92.37	33.5	2.3	0.00	12%		
	18:00	88.08	31.2	1.1	0.00	14%		
	19:00	82.34	28.0	0.0	0.00	20%		
	20:00	77.88	25.5	0.0	0.00	26%		
	21:00	75.58	24.2	0.0	0.00	27%		
	22:00	74.05	23.4	0.0	0.00	27%		
	23:00	71.79	22.1	0.0	0.00	27%		

Baseline Noise Survey
Weather Data

34.094° N, 118.334° W

Station: Enrique Noguera Educational Ga

ID: KCALOSAN1004

Start date: 4/7/2022 **End date:** 4/9/2022

Day	Time	Temperature		Hourly Wind	Precipitation	Humidity	Daily max	Daily min
		F	C	mph	in	%	F	F
4/8/2022	0:00	72.77	22.6	0.1	0.00	21%	96.01	66.26
	1:00	70.27	21.3	0.0	0.00	22%		
	2:00	70.65	21.5	0.3	0.00	21%		
	3:00	75.74	24.3	0.0	0.00	14%		
	4:00	69.48	20.8	0.0	0.00	24%		
	5:00	66.26	19.0	0.0	0.00	28%		
	6:00	69.10	20.6	0.0	0.00	21%		
	7:00	71.11	21.7	0.0	0.00	23%		
	8:00	75.83	24.4	0.0	0.00	27%		
	9:00	87.10	30.6	0.0	0.00	18%		
	10:00	92.05	33.4	0.0	0.00	14%		
	11:00	94.84	34.9	0.0	0.00	13%		
	12:00	95.78	35.4	1.7	0.00	12%		
	13:00	96.01	35.6	2.5	0.00	10%		
	14:00	94.91	34.9	3.7	0.00	10%		
	15:00	94.55	34.8	5.1	0.00	9%		
	16:00	94.81	34.9	4.2	0.00	8%		
	17:00	93.90	34.4	3.2	0.00	9%		
	18:00	90.57	32.5	1.2	0.00	13%		
	19:00	84.52	29.2	0.0	0.00	19%		
	20:00	79.82	26.6	0.0	0.00	24%		
	21:00	77.21	25.1	0.0	0.00	27%		
	22:00	74.87	23.8	0.0	0.00	30%		
	23:00	73.19	22.9	0.0	0.00	32%		

Baseline Noise Survey
Weather Data

34.094° N, 118.334° W

Station: Enrique Noguera Educational Ga

ID: KCALOSAN1004

Start date: 4/7/2022 **End date:** 4/9/2022

Day	Time	Temperature		Hourly Wind	Precipitation	Humidity	Daily max	Daily min
		F	C	mph	in	%	F	F
4/9/2022	0:00	70.84	21.58	0.0	0.00	0.41		
	1:00	69.09	20.61	0.0	0.00	0.37		
	2:00	67.86	19.92	0.0	0.00	0.39		
	3:00	66.57	19.21	0.0	0.00	0.38		
	4:00	64.96	18.31	0.0	0.00	0.42		
	5:00	63.92	17.73	0.0	0.00	0.42		
	6:00	63.19	17.33	0.0	0.00	0.42		
	7:00	65.20	18.44	0.0	0.00	0.45		
	8:00	71.13	21.74	0.0	0.00	0.42		
	9:00	77.75	25.42	0.0	0.00	0.37		
	10:00	81.92	27.73	0.0	0.00	0.35		
	11:00	83.12	28.40	0.0	0.00	0.37		
	12:00	82.31	27.95	1.30	0.00	0.40		
	13:00	81.50	27.50	2.6	0.00	0.44		
	14:00	81.53	27.51	1.6	0.00	0.44		
	15:00	81.99	27.77	2.1	0.00	0.41		
	16:00	80.57	26.98	2.9	0.00	0.42		
	17:00	78.09	25.61	1.3	0.00	0.45		
	18:00	72.03	22.24	1.9	0.00	0.50		
	19:00	67.08	19.49	0.8	0.00	0.58		
	20:00	65.41	18.56	0.5	0.00	0.61		
	21:00	64.28	17.93	0.3	0.00	0.67		
	22:00	63.46	17.48	0.0	0.00	0.74		
	23:00	63.20	17.33	0.3	0.00	0.77		

APPENDIX B

Construction Noise Calculations

Existing Roadway Traffic Noise Levels - Weekday

Station	Vehicles type	Traffic values				Control	Road surface
		AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction							
	Total	554	954	1594	-	none	Average (of DGAC and PCC)
	Automobiles	543	935	1562	56		
	Medium trucks	-	-	-	-		
	Heavy trucks	11	19	32	56		
	Buses	-	-	-	-		
	Motorcycles	-	-	-	-		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction							
	Total	561	961	1599	-	none	Average (of DGAC and PCC)
	Automobiles	550	942	1567	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	11	19	32	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction							
	Total	629	905	1591	-	none	Average (of DGAC and PCC)
	Automobiles	616	887	1559	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	13	18	32	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction							
	Total	742	942	1533	-	none	Average (of DGAC and PCC)
	Automobiles	742	942	1533	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction							
	Total	1164	675	663	-	none	Average (of DGAC and PCC)
	Automobiles	1163	673	661	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	2	2	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction							
	Total	1176	673	645	-	none	Average (of DGAC and PCC)
	Automobiles	1152	660	632	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	24	13	13	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1131	665	635	-	none	Average (of DGAC and PCC)
	Automobiles	1108	652	622	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	23	13	13	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction							
	Total	1021	640	681	-	none	Average (of DGAC and PCC)
	Automobiles	1021	640	681	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	9	24	53	-	none	Average (of DGAC and PCC)
	Automobiles	9	24	52	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	9	12	48	-	none	Average (of DGAC and PCC)
	Automobiles	9	12	47	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	115	65	78	-	none	Average (of DGAC and PCC)
	Automobiles	113	64	76	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	2	1	2	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	77	75	63	-	none	Average (of DGAC and PCC)
	Automobiles	75	74	62	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		

Existing Roadway Traffic Noise Levels - Weekday

Station	Vehicles type	Traffic values AM Veh/h	midday Veh/h	PM Veh/h	Speed km/h	Control	Road surface
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	549	300	323	-	none	Average (of DGAC and PCC)
	Automobiles	538	294	317	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	11	6	6	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction							
	Total	382	264	352	-	none	Average (of DGAC and PCC)
	Automobiles	374	259	345	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	8	5	7	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction							
	Total	843	524	556	-	none	Average (of DGAC and PCC)
	Automobiles	826	514	545	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	17	10	11	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction							
	Total	104	82	82	-	none	Average (of DGAC and PCC)
	Automobiles	102	80	80	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	2	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction							
	Total	352	260	258	-	none	Average (of DGAC and PCC)
	Automobiles	345	255	253	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	7	5	5	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	324	157	245	-	none	Average (of DGAC and PCC)
	Automobiles	318	154	240	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	6	3	5	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1751	638	739	-	none	Average (of DGAC and PCC)
	Automobiles	1716	625	724	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	35	13	15	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1942	675	687	-	none	Average (of DGAC and PCC)
	Automobiles	1903	662	673	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	39	14	14	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Ogden Dr WB T Traffic direction: In entry direction							
	Total	1926	925	741	-	none	Average (of DGAC and PCC)
	Automobiles	1887	907	726	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	39	19	15	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Ogden Dr EB T Traffic direction: In entry direction							
	Total	500	768	910	-	none	Average (of DGAC and PCC)
	Automobiles	490	753	892	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	10	15	18	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	541	573	943	-	none	Average (of DGAC and PCC)
	Automobiles	530	562	924	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	11	11	19	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	607	610	1167	-	none	Average (of DGAC and PCC)
	Automobiles	595	598	1144	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	12	12	23	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		

Existing Roadway Traffic Noise Levels - Weekday

Station	Vehicles type	Traffic values AM Veh/h	midday Veh/h	PM Veh/h	Speed km/h	Control	Road surface
Curson Avenue-6th Street NB W Traffic direction: In entry direction							
	Total	166	129	213	-	none	Average (of DGAC and PCC)
	Automobiles	163	126	209	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	3	3	4	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-6th Street SB W Traffic direction: In entry direction							
	Total	269	122	171	-	none	Average (of DGAC and PCC)
	Automobiles	264	120	168	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	5	2	3	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street SB W Traffic direction: In entry direction							
	Total	90	24	37	-	none	Average (of DGAC and PCC)
	Automobiles	88	24	36	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street NB W Traffic direction: In entry direction							
	Total	26	19	45	-	none	Average (of DGAC and PCC)
	Automobiles	25	19	44	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction							
	Total	486	346	434	-	none	Average (of DGAC and PCC)
	Automobiles	476	339	425	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	10	7	9	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street EB S Traffic direction: In entry direction							
	Total	36	61	33	-	none	Average (of DGAC and PCC)
	Automobiles	35	60	32	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	1	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street NB E Traffic direction: In entry direction							
	Total	8	76	114	-	none	Average (of DGAC and PCC)
	Automobiles	8	74	112	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	2	2	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		

Roadway Segment		Adjacent Land Use	Leq dBA	Daytime dBA	Evening dBA	Nightime dBA	CNEL dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	71.8	70.0	67.0	62.3	71.3
	Between Ogden Dr. and Curson Ave.	Residential	72.2	70.4	67.4	62.7	71.7
	East of Curson Ave.	Residential	71.5	69.7	66.7	62.0	71.0
Ogden Drive	North of 6th St.	Residential	63.1	61.3	58.3	53.6	62.6
	South of Wilshire Blvd.	Commercial	63.4	61.6	58.6	53.9	62.9
Spaulding Avenue	South of Wilshire Blvd.	Commercial	65.4	63.6	60.6	55.9	64.9
Curson Avenue	North of 6th St.	Residential	67.8	66.0	63.0	58.3	67.3
	Between 6th St. and Wilshire Blvd.	Residential	68.6	66.8	63.8	59.1	68.1
	South of Wilshire Blvd.	Residential	71.5	69.7	66.7	62.0	71.0
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	68.8	67.0	64.0	59.3	68.3
	Between Ogden Dr. and Spaulding Ave.	Commercial	67.7	65.9	62.9	58.2	67.2
	Between Spaulding. and Curson Ave.	Museum	69.9	68.1	65.1	60.4	69.4
	East of Curson Ave.	Commercial	68.3	66.5	63.5	58.8	67.8

Existing Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction					
	Total	826	-	none	Average (of DGAC and PCC)
	Automobiles	809	56		
	Medium trucks	-	-		
	Heavy trucks	17	56		
	Buses	-	-		
	Motorcycles	-	-		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction					
	Total	844	-	none	Average (of DGAC and PCC)
	Automobiles	827	56		
	Medium trucks	-	56		
	Heavy trucks	17	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction					
	Total	809	-	none	Average (of DGAC and PCC)
	Automobiles	793	56		
	Medium trucks	-	56		
	Heavy trucks	16	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction					
	Total	812	-	none	Average (of DGAC and PCC)
	Automobiles	812	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction					
	Total	629	-	none	Average (of DGAC and PCC)
	Automobiles	628	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction					
	Total	627	-	none	Average (of DGAC and PCC)
	Automobiles	614	56		
	Medium trucks	-	56		
	Heavy trucks	13	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction					
	Total	619	-	none	Average (of DGAC and PCC)
	Automobiles	607	56		
	Medium trucks	-	56		
	Heavy trucks	12	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction					
	Total	543	-	none	Average (of DGAC and PCC)
	Automobiles	543	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	39	-	none	Average (of DGAC and PCC)
	Automobiles	38	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	19	-	none	Average (of DGAC and PCC)
	Automobiles	19	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	99	-	none	Average (of DGAC and PCC)
	Automobiles	97	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	2	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	130	-	none	Average (of DGAC and PCC)
	Automobiles	127	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		

Existing Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	358	-	none	Average (of DGAC and PCC)
	Automobiles	351	56		
	Medium trucks	-	56		
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction					
	Total	354	-	none	Average (of DGAC and PCC)
	Automobiles	347	56		
	Medium trucks	-	56		
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction					
	Total	448	-	none	Average (of DGAC and PCC)
	Automobiles	439	56		
	Medium trucks	-	56		
	Heavy trucks	9	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction					
	Total	64	-	none	Average (of DGAC and PCC)
	Automobiles	63	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction					
	Total	361	-	none	Average (of DGAC and PCC)
	Automobiles	354	56		
	Medium trucks	-	56		
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	233	-	none	Average (of DGAC and PCC)
	Automobiles	228	56		
	Medium trucks	-	56		
	Heavy trucks	5	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	642	-	none	Average (of DGAC and PCC)
	Automobiles	629	56		
	Medium trucks	-	56		
	Heavy trucks	13	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	617	-	none	Average (of DGAC and PCC)
	Automobiles	605	56		
	Medium trucks	-	56		
	Heavy trucks	12	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Ogden Dr WB T Traffic direction: In entry direction					
	Total	1073	-	none	Average (of DGAC and PCC)
	Automobiles	1052	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Ogden Dr EB T Traffic direction: In entry direction					
	Total	956	-	none	Average (of DGAC and PCC)
	Automobiles	937	56		
	Medium trucks	-	56		
	Heavy trucks	19	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	534	-	none	Average (of DGAC and PCC)
	Automobiles	523	56		
	Medium trucks	-	56		
	Heavy trucks	11	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	553	-	none	Average (of DGAC and PCC)
	Automobiles	542	56		
	Medium trucks	-	56		
	Heavy trucks	11	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		

Existing Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Curson Avenue-6th Street NB W Traffic direction: In entry direction					
	Total	138	-	none	Average (of DGAC and PCC)
	Automobiles	135	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-6th Street SB W Traffic direction: In entry direction					
	Total	134	-	none	Average (of DGAC and PCC)
	Automobiles	131	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street SB W Traffic direction: In entry direction					
	Total	51	-	none	Average (of DGAC and PCC)
	Automobiles	50	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street NB W Traffic direction: In entry direction					
	Total	30	-	none	Average (of DGAC and PCC)
	Automobiles	29	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction					
	Total	418	-	none	Average (of DGAC and PCC)
	Automobiles	410	56		
	Medium trucks	-	56		
	Heavy trucks	8	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street EB S Traffic direction: In entry direction					
	Total	199	-	none	Average (of DGAC and PCC)
	Automobiles	195	56		
	Medium trucks	-	56		
	Heavy trucks	4	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street NB E Traffic direction: In entry direction					
	Total	145	-	none	Average (of DGAC and PCC)
	Automobiles	142	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nightime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	70.3	68.5	65.5	60.8	69.8
	Between Ogden Dr. and Curson Ave.	Residential	68.2	66.4	63.4	58.7	67.7
	East of Curson Ave.	Residential	68.2	66.4	63.4	58.7	67.7
Ogden Drive	North of 6th St.	Residential	61.3	59.5	56.5	51.8	60.8
	South of Wilshire Blvd.	Commercial	61.3	59.5	56.5	51.8	60.8
Spaulding Avenue	South of Wilshire Blvd.	Commercial	63.7	61.9	58.9	54.2	63.2
Curson Avenue	North of 6th St.	Residential	65.3	63.5	60.5	55.8	64.8
	Between 6th St. and Wilshire Blvd.	Residential	68.1	66.3	63.3	58.6	67.6
	South of Wilshire Blvd.	Residential	69.6	67.8	64.8	60.1	69.1
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	66.5	64.7	61.7	57.0	66.0
	Between Ogden Dr. and Spaulding Ave.	Commercial	65.6	63.8	60.8	56.1	65.1
	Between Spaulding. and Curson Ave.	Museum	67.5	65.7	62.7	58.0	67.0
	East of Curson Ave.	Commercial	66.3	64.5	61.5	56.8	65.8

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	168	Dozer	0	40	50	82
Excavator	168	Excavator	1	40	50	81
Concrete Saw	168	Concrete Saw	0	20	50	90
Dozer	1206	Dozer	1	40	50	82
Excavator	1206	Excavator	1	40	50	81
Concrete Saw	1206	Concrete Saw	1	20	50	90
Dozer	540	Dozer	1	40	50	82
Excavator	540	Excavator	1	40	50	81
Concrete Saw	540	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	61.5	65.5
Concrete Saw		
Dozer	45.4	49.4
Excavator	44.4	48.4
Concrete Saw	50.4	57.4
Dozer	52.4	56.3
Excavator	51.4	55.3
Concrete Saw		
Total [1]	**62.8**	**65.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	68.8	69.6	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	370	Dozer	0	40	50	82
Excavator	370	Excavator	1	40	50	81
Concrete Saw	370	Concrete Saw	0	20	50	90
Dozer	735	Dozer	1	40	50	82
Excavator	735	Excavator	1	40	50	81
Concrete Saw	735	Concrete Saw	1	20	50	90
Dozer	330	Dozer	1	40	50	82
Excavator	300	Excavator	1	40	50	81
Concrete Saw	300	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	54.6	58.6
Concrete Saw		
Dozer	49.7	53.7
Excavator	48.7	52.7
Concrete Saw	54.7	61.7
Dozer	56.6	60.6
Excavator	56.5	60.4
Concrete Saw		
Total [1]	**62.2**	**61.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	67.2	67.0	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	245	Dozer	0	40	50	82
Excavator	245	Excavator	1	40	50	81
Concrete Saw	245	Concrete Saw	0	20	50	90
Dozer	422	Dozer	1	40	50	82
Excavator	422	Excavator	1	40	50	81
Concrete Saw	422	Concrete Saw	1	20	50	90
Dozer	1010	Dozer	1	40	50	82
Excavator	1010	Excavator	1	40	50	81
Concrete Saw	1010	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	58.2	62.2
Concrete Saw		
Dozer	54.5	58.5
Excavator	53.5	57.5
Concrete Saw	59.5	66.5
Dozer	46.9	50.9
Excavator	45.9	49.9
Concrete Saw		
Total [1]	**63.3**	**66.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	75.2	75.5	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	137	Dozer	0	40	50	82
Excavator	137	Excavator	1	40	50	81
Concrete Saw	137	Concrete Saw	0	20	50	90
Dozer	265	Dozer	1	40	50	82
Excavator	265	Excavator	1	40	50	81
Concrete Saw	265	Concrete Saw	1	20	50	90
Dozer	1002	Dozer	1	40	50	82
Excavator	1002	Excavator	1	40	50	81
Concrete Saw	1002	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	63.3	67.2
Concrete Saw		
Dozer	58.5	62.5
Excavator	57.5	61.5
Concrete Saw	63.5	70.5
Dozer	47.0	51.0
Excavator	46.0	50.0
Concrete Saw		
Total [1]	**67.6**	**70.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	68.8	71.2	62.8	67.8	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	135	Dozer	0	40	50	82
Excavator	135	Excavator	1	40	50	81
Concrete Saw	135	Concrete Saw	0	20	50	90
Dozer	405	Dozer	1	40	50	82
Excavator	405	Excavator	1	40	50	81
Concrete Saw	405	Concrete Saw	1	20	50	90
Dozer	1055	Dozer	1	40	50	82
Excavator	1055	Excavator	1	40	50	81
Concrete Saw	1055	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	63.4	67.4
Concrete Saw		
Dozer	54.9	58.8
Excavator	53.9	57.8
Concrete Saw	59.8	66.8
Dozer	46.5	50.5
Excavator	45.5	49.5
Concrete Saw		
Total [1]	**65.8**	**67.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	68.3	69.3	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	133	Dozer	0	40	50	82
Excavator	133	Excavator	1	40	50	81
Concrete Saw	133	Concrete Saw	0	20	50	90
Dozer	668	Dozer	1	40	50	82
Excavator	668	Excavator	1	40	50	81
Concrete Saw	668	Concrete Saw	1	20	50	90
Dozer	1108	Dozer	1	40	50	82
Excavator	1108	Excavator	1	40	50	81
Concrete Saw	1108	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	63.5	67.5
Concrete Saw		
Dozer	50.5	54.5
Excavator	49.5	53.5
Concrete Saw	55.5	62.5
Dozer	46.1	50.1
Excavator	45.1	49.1
Concrete Saw		
Total [1]	**64.6**	**67.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	70.9	71.8	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	116	Dozer	0	40	50	82
Excavator	116	Excavator	1	40	50	81
Concrete Saw	116	Concrete Saw	0	20	50	90
Dozer	678	Dozer	1	40	50	82
Excavator	678	Excavator	1	40	50	81
Concrete Saw	678	Concrete Saw	1	20	50	90
Dozer	815	Dozer	1	40	50	82
Excavator	815	Excavator	1	40	50	81
Concrete Saw	815	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	64.7	68.7
Concrete Saw		
Dozer	50.4	54.4
Excavator	49.4	53.4
Concrete Saw	55.4	62.4
Dozer	48.8	52.8
Excavator	47.8	51.8
Concrete Saw		
Total [1]	**65.6**	**68.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	75.1	75.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	556	Dozer	0	40	50	82
Excavator	556	Excavator	1	40	50	81
Concrete Saw	556	Concrete Saw	0	20	50	90
Dozer	1223	Dozer	1	40	50	82
Excavator	1223	Excavator	1	40	50	81
Concrete Saw	1223	Concrete Saw	1	20	50	90
Dozer	418	Dozer	1	40	50	82
Excavator	418	Excavator	1	40	50	81
Concrete Saw	418	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	51.1	55.1
Concrete Saw		
Dozer	45.3	49.2
Excavator	44.3	48.2
Concrete Saw	50.2	57.2
Dozer	54.6	58.6
Excavator	53.6	57.6
Concrete Saw		
Total [1]	**59.1**	**58.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.7	67.7	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	168	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	168	Backhoe	1	40	50	78
Rubber Tired Dozers	1206	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1206	Backhoe	2	40	50	78
Rubber Tired Dozers	540	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	540	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	62.5	66.5
Backhoe	58.5	62.5
Dozer	45.4	54.4
Backhoe	44.4	53.4
Dozer	52.4	61.3
Backhoe	48.4	57.3
Total [1]	**64.4**	**66.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	69.2	70.0	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	95	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	95	Backhoe	1	40	50	78
Rubber Tired Dozers	735	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	735	Backhoe	2	40	50	78
Rubber Tired Dozers	330	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	330	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	67.4	71.4
Backhoe	63.4	67.4
Dozer	49.7	58.7
Backhoe	48.7	57.7
Dozer	56.6	65.6
Backhoe	52.6	61.6
Total [1]	**69.3**	**71.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	70.8	72.4	65.5	70.5	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	146	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	146	Backhoe	1	40	50	78
Rubber Tired Dozers	422	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	422	Backhoe	2	40	50	78
Rubber Tired Dozers	1010	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1010	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	63.7	67.7
Backhoe	59.7	63.7
Dozer	54.5	63.5
Backhoe	53.5	62.5
Dozer	46.9	55.9
Backhoe	42.9	51.9
Total [1]	**65.9**	**67.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	75.4	75.7	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	102	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	102	Backhoe	1	40	50	78
Rubber Tired Dozers	265	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	265	Backhoe	2	40	50	78
Rubber Tired Dozers	1002	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1002	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	66.8	70.8
Backhoe	62.8	66.8
Dozer	58.5	67.5
Backhoe	57.5	66.5
Dozer	47.0	56.0
Backhoe	43.0	52.0
Total [1]	**69.1**	**70.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	70.0	71.4	62.8	67.8	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	85	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	85	Backhoe	1	40	50	78
Rubber Tired Dozers	405	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	405	Backhoe	2	40	50	78
Rubber Tired Dozers	1055	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1055	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	68.4	72.4
Backhoe	64.4	68.4
Dozer	54.9	63.8
Backhoe	53.9	62.8
Dozer	46.5	55.5
Backhoe	42.5	51.5
Total [1]	**70.1**	**72.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	71.2	73.1	64.8	69.8	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	133	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	133	Backhoe	1	40	50	78
Rubber Tired Dozers	668	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	668	Backhoe	2	40	50	78
Rubber Tired Dozers	1108	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1108	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	64.5	68.5
Backhoe	60.5	64.5
Dozer	50.5	59.5
Backhoe	49.5	58.5
Dozer	46.1	55.1
Backhoe	42.1	51.1
Total [1]	**66.3**	**68.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	71.4	72.2	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	116	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	116	Backhoe	1	40	50	78
Rubber Tired Dozers	678	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	678	Backhoe	2	40	50	78
Rubber Tired Dozers	815	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	815	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	65.7	69.7
Backhoe	61.7	65.7
Dozer	50.4	59.4
Backhoe	49.4	58.4
Dozer	48.8	57.8
Backhoe	44.8	53.8
Total [1]	**67.4**	**69.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	75.4	75.8	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	683	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	683	Backhoe	1	40	50	78
Rubber Tired Dozers	1223	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1223	Backhoe	2	40	50	78
Rubber Tired Dozers	418	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	418	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	50.3	54.3
Backhoe	46.3	50.3
Dozer	45.3	54.2
Backhoe	44.3	53.2
Dozer	54.6	63.6
Backhoe	50.6	59.6
Total [1]	**57.9**	**63.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.6	68.7	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	168	Grader	0	40	50	85
Excavators	168	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	168	Backhoe	1	40	50	78
Scrapers	168	Scraper	1	40	50	84
Rubber Tired Dozers	168	Dozer	0	40	50	82
Graders	1206	Grader	1	40	50	85
Excavators	1206	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	1206	Backhoe	0	40	50	78
Scrapers	1206	Scraper	0	40	50	84
Rubber Tired Dozers	1206	Dozer	1	40	50	82
Graders	540	Grader	0	40	50	85
Excavators	540	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	540	Backhoe	1	40	50	78
Scrapers	540	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	61.5	65.5
Backhoe	58.5	62.5
Scraper	64.5	68.5
Dozer		
Grader	48.4	52.4
Excavator		
Backhoe		
Scraper		
Dozer	45.4	49.4
Grader		
Excavator	51.4	55.3
Backhoe	48.4	52.3
Scraper	54.4	58.3
Total [1]	**67.4**	**68.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	70.5	71.0	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	95	Grader	0	40	50	85
Excavators	95	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	95	Backhoe	1	40	50	78
Scrapers	95	Scraper	1	40	50	84
Rubber Tired Dozers	95	Dozer	0	40	50	82
Graders	735	Grader	1	40	50	85
Excavators	735	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	735	Backhoe	0	40	50	78
Scrapers	735	Scraper	0	40	50	84
Rubber Tired Dozers	735	Dozer	1	40	50	82
Graders	330	Grader	0	40	50	85
Excavators	330	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	330	Backhoe	1	40	50	78
Scrapers	300	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	66.4	70.4
Backhoe	63.4	67.4
Scraper	69.4	73.4
Dozer		
Grader	52.7	56.7
Excavator		
Backhoe		
Scraper		
Dozer	49.7	53.7
Grader		
Excavator	55.6	59.6
Backhoe	52.6	56.6
Scraper	59.5	63.4
Total [1]	**72.3**	**73.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	73.2	74.1	65.5	70.5	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	146	Grader	0	40	50	85
Excavators	146	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	146	Backhoe	1	40	50	78
Scrapers	146	Scraper	1	40	50	84
Rubber Tired Dozers	146	Dozer	0	40	50	82
Graders	422	Grader	1	40	50	85
Excavators	422	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	422	Backhoe	0	40	50	78
Scrapers	422	Scraper	0	40	50	84
Rubber Tired Dozers	422	Dozer	1	40	50	82
Graders	1010	Grader	0	40	50	85
Excavators	1010	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1010	Backhoe	1	40	50	78
Scrapers	1010	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	62.7	66.7
Backhoe	59.7	63.7
Scraper	65.7	69.7
Dozer		
Grader	57.5	61.5
Excavator		
Backhoe		
Scraper		
Dozer	54.5	58.5
Grader		
Excavator	45.9	49.9
Backhoe	42.9	46.9
Scraper	48.9	52.9
Total [1]	**68.8**	**69.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	75.8	76.0	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	102	Grader	0	40	50	85
Excavators	102	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	102	Backhoe	1	40	50	78
Scrapers	102	Scraper	1	40	50	84
Rubber Tired Dozers	102	Dozer	0	40	50	82
Graders	265	Grader	1	40	50	85
Excavators	265	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	265	Backhoe	0	40	50	78
Scrapers	265	Scraper	0	40	50	84
Rubber Tired Dozers	265	Dozer	1	40	50	82
Graders	1002	Grader	0	40	50	85
Excavators	1002	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1002	Backhoe	1	40	50	78
Scrapers	1002	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	65.8	69.8
Backhoe	62.8	66.8
Scraper	68.8	72.8
Dozer		
Grader	61.5	65.5
Excavator		
Backhoe		
Scraper		
Dozer	58.5	62.5
Grader		
Excavator	46.0	50.0
Backhoe	43.0	47.0
Scraper	49.0	53.0
Total [1]	**71.9**	**72.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	72.4	73.2	62.8	67.8	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	85	Grader	0	40	50	85
Excavators	85	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	85	Backhoe	1	40	50	78
Scrapers	85	Scraper	1	40	50	84
Rubber Tired Dozers	85	Dozer	0	40	50	82
Graders	405	Grader	1	40	50	85
Excavators	405	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	405	Backhoe	0	40	50	78
Scrapers	405	Scraper	0	40	50	84
Rubber Tired Dozers	405	Dozer	1	40	50	82
Graders	1055	Grader	0	40	50	85
Excavators	1055	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1055	Backhoe	1	40	50	78
Scrapers	1055	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	67.4	71.4
Backhoe	64.4	68.4
Scraper	70.4	74.4
Dozer		
Grader	57.9	61.8
Excavator		
Backhoe		
Scraper		
Dozer	54.9	58.8
Grader		
Excavator	45.5	49.5
Backhoe	42.5	46.5
Scraper	48.5	52.5
Total [1]	**73.1**	**74.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	73.7	74.8	64.8	69.8	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	133	Grader	0	40	50	85
Excavators	133	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	133	Backhoe	1	40	50	78
Scrapers	133	Scraper	1	40	50	84
Rubber Tired Dozers	133	Dozer	0	40	50	82
Graders	668	Grader	1	40	50	85
Excavators	668	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	668	Backhoe	0	40	50	78
Scrapers	668	Scraper	0	40	50	84
Rubber Tired Dozers	668	Dozer	1	40	50	82
Graders	1108	Grader	0	40	50	85
Excavators	1108	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1108	Backhoe	1	40	50	78
Scrapers	1108	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	63.5	67.5
Backhoe	60.5	64.5
Scraper	66.5	70.5
Dozer		
Grader	53.5	57.5
Excavator		
Backhoe		
Scraper		
Dozer	50.5	54.5
Grader		
Excavator	45.1	49.1
Backhoe	42.1	46.1
Scraper	48.1	52.1
Total [1]	**69.2**	**70.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	72.5	73.2	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	116	Grader	0	40	50	85
Excavators	116	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	116	Backhoe	1	40	50	78
Scrapers	116	Scraper	1	40	50	84
Rubber Tired Dozers	116	Dozer	0	40	50	82
Graders	678	Grader	1	40	50	85
Excavators	678	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	678	Backhoe	0	40	50	78
Scrapers	678	Scraper	0	40	50	84
Rubber Tired Dozers	678	Dozer	1	40	50	82
Graders	815	Grader	0	40	50	85
Excavators	815	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	815	Backhoe	1	40	50	78
Scrapers	815	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	64.7	68.7
Backhoe	61.7	65.7
Scraper	67.7	71.7
Dozer		
Grader	53.4	57.4
Excavator		
Backhoe		
Scraper		
Dozer	50.4	54.4
Grader		
Excavator	47.8	51.8
Backhoe	44.8	48.8
Scraper	50.8	54.8
Total [1]	**70.4**	**71.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	76.0	76.4	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	683	Grader	0	40	50	85
Excavators	683	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	683	Backhoe	1	40	50	78
Scrapers	683	Scraper	1	40	50	84
Rubber Tired Dozers	683	Dozer	0	40	50	82
Graders	1223	Grader	1	40	50	85
Excavators	1223	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	1223	Backhoe	0	40	50	78
Scrapers	1223	Scraper	0	40	50	84
Rubber Tired Dozers	1223	Dozer	1	40	50	82
Graders	418	Grader	0	40	50	85
Excavators	418	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	418	Backhoe	1	40	50	78
Scrapers	418	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Le Dozer

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	49.3	53.3
Backhoe	46.3	50.3
Scraper	52.3	56.3
Dozer		
Grader	48.3	52.2
Excavator		
Backhoe		
Scraper		
Dozer	45.3	49.2
Grader		
Excavator	53.6	57.6
Backhoe	50.6	54.6
Scraper	56.6	60.6
Total [1]	**60.8**	**60.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	68.0	68.0	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	820	Front End Loader	1	40	50	79
Generator Sets	820	Generator	0	50	50	81
Cranes	820	Crane	0	16	50	81
Welders	820	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	820	Backhoe	1	40	50	78
Forklifts	959	Front End Loader	1	40	50	79
Generator Sets	959	Generator	1	50	50	81
Cranes	959	Crane	1	16	50	81
Welders	959	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	959	Backhoe	1	40	50	78
Forklifts	540	Front End Loader	1	40	50	79
Generator Sets	540	Generator	0	50	50	81
Cranes	540	Crane	0	16	50	81
Tractors/Loaders/Backh	540	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	45.7	49.7
Generator		
Crane		
Welder/Torch		
Backhoe	44.7	48.7
Front End Loader	44.4	48.3
Generator	47.3	50.3
Crane	42.4	50.3
Welder/Torch	39.4	43.3
Backhoe	43.4	47.3
Front End Loader	49.4	53.3
Generator		
Crane		
Backhoe	48.4	52.3
Total [1]	**55.4**	**53.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.8	67.7	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	271	Front End Loader	1	40	50	79
Generator Sets	271	Generator	0	50	50	81
Cranes	271	Crane	0	16	50	81
Welders	271	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	271	Backhoe	1	40	50	78
Forklifts	735	Front End Loader	1	40	50	79
Generator Sets	735	Generator	1	50	50	81
Cranes	735	Crane	1	16	50	81
Welders	735	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	735	Backhoe	1	40	50	78
Forklifts	518	Front End Loader	1	40	50	79
Generator Sets	518	Generator	0	50	50	81
Cranes	518	Crane	0	16	50	81
Tractors/Loaders/Backh	518	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	55.3	59.3
Generator		
Crane		
Welder/Torch		
Backhoe	54.3	58.3
Front End Loader	46.7	50.7
Generator	49.6	52.7
Crane	44.7	52.7
Welder/Torch	41.7	45.7
Backhoe	45.7	49.7
Front End Loader	49.7	53.7
Generator		
Crane		
Backhoe	48.7	52.7
Total [1]	**60.0**	**59.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	66.6	66.4	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	683	Front End Loader	1	40	50	79
Generator Sets	683	Generator	0	50	50	81
Cranes	683	Crane	0	16	50	81
Welders	683	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	683	Backhoe	1	40	50	78
Forklifts	422	Front End Loader	1	40	50	79
Generator Sets	422	Generator	1	50	50	81
Cranes	422	Crane	1	16	50	81
Welders	422	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	422	Backhoe	1	40	50	78
Forklifts	565	Front End Loader	1	40	50	79
Generator Sets	565	Generator	0	50	50	81
Cranes	565	Crane	0	16	50	81
Tractors/Loaders/Backh	565	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	47.3	51.3
Generator		
Crane		
Welder/Torch		
Backhoe	46.3	50.3
Front End Loader	51.5	55.5
Generator	54.5	57.5
Crane	49.5	57.5
Welder/Torch	46.5	50.5
Backhoe	50.5	54.5
Front End Loader	49.0	52.9
Generator		
Crane		
Backhoe	48.0	51.9
Total [1]	**59.6**	**57.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	75.0	75.0	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	735	Front End Loader	1	40	50	79
Generator Sets	735	Generator	0	50	50	81
Cranes	735	Crane	0	16	50	81
Welders	735	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	735	Backhoe	1	40	50	78
Forklifts	265	Front End Loader	1	40	50	79
Generator Sets	265	Generator	1	50	50	81
Cranes	265	Crane	1	16	50	81
Welders	265	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	265	Backhoe	1	40	50	78
Forklifts	518	Front End Loader	1	40	50	79
Generator Sets	518	Generator	0	50	50	81
Cranes	518	Crane	0	16	50	81
Tractors/Loaders/Backh	518	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	46.7	50.7
Generator		
Crane		
Welder/Torch		
Backhoe	45.7	49.7
Front End Loader	55.5	59.5
Generator	58.5	61.5
Crane	53.6	61.5
Welder/Torch	50.5	54.5
Backhoe	54.5	58.5
Front End Loader	49.7	53.7
Generator		
Crane		
Backhoe	48.7	52.7
Total [1]	**62.9**	**61.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	65.9	65.2	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	890	Front End Loader	1	40	50	79
Generator Sets	890	Generator	0	50	50	81
Cranes	890	Crane	0	16	50	81
Welders	890	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	890	Backhoe	1	40	50	78
Forklifts	405	Front End Loader	1	40	50	79
Generator Sets	405	Generator	1	50	50	81
Cranes	405	Crane	1	16	50	81
Welders	405	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	405	Backhoe	1	40	50	78
Forklifts	636	Front End Loader	1	40	50	79
Generator Sets	636	Generator	0	50	50	81
Cranes	636	Crane	0	16	50	81
Tractors/Loaders/Backh	636	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	45.0	49.0
Generator		
Crane		
Welder/Torch		
Backhoe	44.0	48.0
Front End Loader	51.9	55.8
Generator	54.8	57.8
Crane	49.9	57.8
Welder/Torch	46.9	50.8
Backhoe	50.9	54.8
Front End Loader	47.9	51.9
Generator		
Crane		
Backhoe	46.9	50.9
Total [1]	**59.5**	**57.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	65.9	65.6	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	1038	Front End Loader	1	40	50	79
Generator Sets	1038	Generator	0	50	50	81
Cranes	1038	Crane	0	16	50	81
Welders	1038	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	1038	Backhoe	1	40	50	78
Forklifts	668	Front End Loader	1	40	50	79
Generator Sets	668	Generator	1	50	50	81
Cranes	668	Crane	1	16	50	81
Welders	668	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	668	Backhoe	1	40	50	78
Forklifts	798	Front End Loader	1	40	50	79
Generator Sets	798	Generator	0	50	50	81
Cranes	798	Crane	0	16	50	81
Tractors/Loaders/Backh	798	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	43.7	47.7
Generator		
Crane		
Welder/Torch		
Backhoe	42.7	46.7
Front End Loader	47.5	51.5
Generator	50.5	53.5
Crane	45.5	53.5
Welder/Torch	42.5	46.5
Backhoe	46.5	50.5
Front End Loader	46.0	49.9
Generator		
Crane		
Backhoe	45.0	48.9
Total [1]	**55.8**	**53.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	70.0	69.9	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	805	Front End Loader	1	40	50	79
Generator Sets	805	Generator	0	50	50	81
Cranes	805	Crane	0	16	50	81
Welders	805	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	805	Backhoe	1	40	50	78
Forklifts	678	Front End Loader	1	40	50	79
Generator Sets	678	Generator	1	50	50	81
Cranes	678	Crane	1	16	50	81
Welders	678	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	678	Backhoe	1	40	50	78
Forklifts	671	Front End Loader	1	40	50	79
Generator Sets	671	Generator	0	50	50	81
Cranes	671	Crane	0	16	50	81
Tractors/Loaders/Backh	671	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	45.9	49.9
Generator		
Crane		
Welder/Torch		
Backhoe	44.9	48.9
Front End Loader	47.4	51.4
Generator	50.3	53.4
Crane	45.4	53.4
Welder/Torch	42.4	46.4
Backhoe	46.4	50.4
Front End Loader	47.5	51.4
Generator		
Crane		
Backhoe	46.5	50.4
Total [1]	**56.3**	**53.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.7	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	660	Front End Loader	1	40	50	79
Generator Sets	660	Generator	0	50	50	81
Cranes	660	Crane	0	16	50	81
Welders	660	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	660	Backhoe	1	40	50	78
Forklifts	1223	Front End Loader	1	40	50	79
Generator Sets	1223	Generator	1	50	50	81
Cranes	1223	Crane	1	16	50	81
Welders	1223	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	1223	Backhoe	1	40	50	78
Forklifts	1031	Front End Loader	1	40	50	79
Generator Sets	1031	Generator	0	50	50	81
Cranes	1031	Crane	0	16	50	81
Tractors/Loaders/Backh	1031	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	47.6	51.6
Generator		
Crane		
Welder/Torch		
Backhoe	46.6	50.6
Front End Loader	42.3	46.2
Generator	45.2	48.2
Crane	40.3	48.2
Welder/Torch	37.3	41.2
Backhoe	41.3	45.2
Front End Loader	43.7	47.7
Generator		
Crane		
Backhoe	42.7	46.7
Total [1]	**53.5**	**51.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.3	67.2	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	1094	Paver	2	50	50	77
Roller	1094	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	45.2	48.2
Roller	44.2	51.2
Total [1]	**47.7**	**51.2**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.5	67.6	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	622	Paver	2	50	50	77
Roller	622	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	50.1	53.1
Roller	49.1	56.1
Total [1]	**52.7**	**56.1**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	65.7	66.0	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	338	Paver	2	50	50	77
Roller	338	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	55.4	58.4
Roller	54.4	61.4
Total [1]	**57.9**	**61.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	75.0	75.1	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	346	Paver	2	50	50	77
Roller	346	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	55.2	58.2
Roller	54.2	61.2
Total [1]	**57.7**	**61.2**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	64.0	65.1	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	571	Paver	2	50	50	77
Roller	571	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	50.8	53.9
Roller	49.9	56.9
Total [1]	**53.4**	**56.9**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	65.1	65.4	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	836	Paver	2	50	50	77
Roller	836	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	47.5	50.5
Roller	46.6	53.5
Total [1]	**50.1**	**53.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	69.8	69.9	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	824	Paver	2	50	50	77
Roller	824	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	47.7	50.7
Roller	46.7	53.7
Total [1]	**50.2**	**53.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.6	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	1264	Paver	2	50	50	77
Roller	1264	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Paver	43.9	47.0
Roller	43.0	50.0
Total [1]	**46.5**	**50.0**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.1	67.2	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	540	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	48.4	52.3
Total [1]	**48.4**	**52.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.6	67.6	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	271	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	54.3	58.3
Total [1]	**54.3**	**58.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	65.8	66.3	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	422	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	50.5	54.5
Total [1]	**50.5**	**54.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	74.9	74.9	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	265	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	54.5	58.5
Total [1]	**54.5**	**58.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	63.4	64.2	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	405	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	50.9	54.8
Total [1]	**50.9**	**54.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	65.0	65.2	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	668	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	46.5	50.5
Total [1]	**46.5**	**50.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	69.8	69.9	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	671	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	46.5	50.4
Total [1]	**46.5**	**50.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.6	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	660	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	46.6	50.6
Total [1]	**46.6**	**50.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.1	67.2	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	168	Dozer	0	40	50	82
Excavator	168	Excavator	1	40	50	81
Concrete Saw	168	Concrete Saw	0	20	50	90
Dozer	1206	Dozer	1	40	50	82
Excavator	1206	Excavator	1	40	50	81
Concrete Saw	1206	Concrete Saw	1	20	50	90
Dozer	540	Dozer	1	40	50	82
Excavator	540	Excavator	1	40	50	81
Concrete Saw	540	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	51.5	55.5
Concrete Saw		
Dozer	35.4	39.4
Excavator	34.4	38.4
Concrete Saw	40.4	47.4
Dozer	42.4	46.3
Excavator	41.4	45.3
Concrete Saw		
Total [1]	**52.8**	**55.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.6	67.8	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	370	Dozer	0	40	50	82
Excavator	370	Excavator	1	40	50	81
Concrete Saw	370	Concrete Saw	0	20	50	90
Dozer	735	Dozer	1	40	50	82
Excavator	735	Excavator	1	40	50	81
Concrete Saw	735	Concrete Saw	1	20	50	90
Dozer	330	Dozer	1	40	50	82
Excavator	300	Excavator	1	40	50	81
Concrete Saw	300	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	44.6	48.6
Concrete Saw		
Dozer	39.7	43.7
Excavator	38.7	42.7
Concrete Saw	44.7	51.7
Dozer	46.6	50.6
Excavator	46.5	50.4
Concrete Saw		
Total [1]	**52.2**	**51.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	65.7	65.7	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	245	Dozer	0	40	50	82
Excavator	245	Excavator	1	40	50	81
Concrete Saw	245	Concrete Saw	0	20	50	90
Dozer	422	Dozer	1	40	50	82
Excavator	422	Excavator	1	40	50	81
Concrete Saw	422	Concrete Saw	1	20	50	90
Dozer	1010	Dozer	1	40	50	82
Excavator	1010	Excavator	1	40	50	81
Concrete Saw	1010	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	48.2	52.2
Concrete Saw		
Dozer	44.5	48.5
Excavator	43.5	47.5
Concrete Saw	49.5	56.5
Dozer	36.9	40.9
Excavator	35.9	39.9
Concrete Saw		
Total [1]	**53.3**	**56.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	74.9	75.0	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	137	Dozer	0	40	50	82
Excavator	137	Excavator	1	40	50	81
Concrete Saw	137	Concrete Saw	0	20	50	90
Dozer	265	Dozer	1	40	50	82
Excavator	265	Excavator	1	40	50	81
Concrete Saw	265	Concrete Saw	1	20	50	90
Dozer	1002	Dozer	1	40	50	82
Excavator	1002	Excavator	1	40	50	81
Concrete Saw	1002	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	53.3	57.2
Concrete Saw		
Dozer	48.5	52.5
Excavator	47.5	51.5
Concrete Saw	53.5	60.5
Dozer	37.0	41.0
Excavator	36.0	40.0
Concrete Saw		
Total [1]	**57.6**	**60.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	63.9	64.8	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	135	Dozer	0	40	50	82
Excavator	135	Excavator	1	40	50	81
Concrete Saw	135	Concrete Saw	0	20	50	90
Dozer	405	Dozer	1	40	50	82
Excavator	405	Excavator	1	40	50	81
Concrete Saw	405	Concrete Saw	1	20	50	90
Dozer	1055	Dozer	1	40	50	82
Excavator	1055	Excavator	1	40	50	81
Concrete Saw	1055	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	53.4	57.4
Concrete Saw		
Dozer	44.9	48.8
Excavator	43.9	47.8
Concrete Saw	49.8	56.8
Dozer	36.5	40.5
Excavator	35.5	39.5
Concrete Saw		
Total [1]	**55.8**	**57.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	65.3	65.5	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	133	Dozer	0	40	50	82
Excavator	133	Excavator	1	40	50	81
Concrete Saw	133	Concrete Saw	0	20	50	90
Dozer	668	Dozer	1	40	50	82
Excavator	668	Excavator	1	40	50	81
Concrete Saw	668	Concrete Saw	1	20	50	90
Dozer	1108	Dozer	1	40	50	82
Excavator	1108	Excavator	1	40	50	81
Concrete Saw	1108	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	63.5	67.5
Concrete Saw		
Dozer	50.5	54.5
Excavator	49.5	53.5
Concrete Saw	55.5	62.5
Dozer	46.1	50.1
Excavator	45.1	49.1
Concrete Saw		
Total [1]	**64.6**	**67.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	70.9	71.8	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	116	Dozer	0	40	50	82
Excavator	116	Excavator	1	40	50	81
Concrete Saw	116	Concrete Saw	0	20	50	90
Dozer	678	Dozer	1	40	50	82
Excavator	678	Excavator	1	40	50	81
Concrete Saw	678	Concrete Saw	1	20	50	90
Dozer	815	Dozer	1	40	50	82
Excavator	815	Excavator	1	40	50	81
Concrete Saw	815	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	64.7	68.7
Concrete Saw		
Dozer	50.4	54.4
Excavator	49.4	53.4
Concrete Saw	55.4	62.4
Dozer	48.8	52.8
Excavator	47.8	51.8
Concrete Saw		
Total [1]	**65.6**	**68.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	75.1	75.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Demolition - Mitigated Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Dozer	556	Dozer	0	40	50	82
Excavator	556	Excavator	1	40	50	81
Concrete Saw	556	Concrete Saw	0	20	50	90
Dozer	1223	Dozer	1	40	50	82
Excavator	1223	Excavator	1	40	50	81
Concrete Saw	1223	Concrete Saw	1	20	50	90
Dozer	418	Dozer	1	40	50	82
Excavator	418	Excavator	1	40	50	81
Concrete Saw	418	Concrete Saw	0	20	50	90

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer		
Excavator	51.1	55.1
Concrete Saw		
Dozer	45.3	49.2
Excavator	44.3	48.2
Concrete Saw	50.2	57.2
Dozer	54.6	58.6
Excavator	53.6	57.6
Concrete Saw		
Total [1]	**59.1**	**58.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.7	67.7	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	168	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	168	Backhoe	1	40	50	78
Rubber Tired Dozers	1206	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1206	Backhoe	2	40	50	78
Rubber Tired Dozers	540	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	540	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	52.5	56.5
Backhoe	48.5	52.5
Dozer	35.4	39.4
Backhoe	34.4	38.4
Dozer	42.4	46.3
Backhoe	38.4	42.3
Total [1]	**54.4**	**56.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.7	67.8	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	95	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	95	Backhoe	1	40	50	78
Rubber Tired Dozers	735	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	735	Backhoe	2	40	50	78
Rubber Tired Dozers	330	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	330	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	57.4	61.4
Backhoe	53.4	57.4
Dozer	39.7	43.7
Backhoe	38.7	42.7
Dozer	46.6	50.6
Backhoe	42.6	46.6
Total [1]	**59.3**	**61.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	66.4	66.9	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	146	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	146	Backhoe	1	40	50	78
Rubber Tired Dozers	422	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	422	Backhoe	2	40	50	78
Rubber Tired Dozers	1010	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1010	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	53.7	57.7
Backhoe	49.7	53.7
Dozer	44.5	48.5
Backhoe	43.5	47.5
Dozer	36.9	40.9
Backhoe	32.9	36.9
Total [1]	**55.9**	**57.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	75.0	75.0	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	102	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	102	Backhoe	1	40	50	78
Rubber Tired Dozers	265	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	265	Backhoe	2	40	50	78
Rubber Tired Dozers	1002	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1002	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	56.8	60.8
Backhoe	52.8	56.8
Dozer	48.5	52.5
Backhoe	47.5	51.5
Dozer	37.0	41.0
Backhoe	33.0	37.0
Total [1]	**59.1**	**60.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	64.3	64.9	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	85	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	85	Backhoe	1	40	50	78
Rubber Tired Dozers	405	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	405	Backhoe	2	40	50	78
Rubber Tired Dozers	1055	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1055	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	58.4	62.4
Backhoe	54.4	58.4
Dozer	44.9	48.8
Backhoe	43.9	47.8
Dozer	36.5	40.5
Backhoe	32.5	36.5
Total [1]	**60.1**	**62.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	66.1	66.8	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	133	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	133	Backhoe	1	40	50	78
Rubber Tired Dozers	668	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	668	Backhoe	2	40	50	78
Rubber Tired Dozers	1108	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1108	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	64.5	68.5
Backhoe	60.5	54.5
Dozer	50.5	44.5
Backhoe	49.5	43.5
Dozer	46.1	40.1
Backhoe	42.1	36.1
Total [1]	**66.3**	**68.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	71.4	72.2	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	116	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	116	Backhoe	1	40	50	78
Rubber Tired Dozers	678	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	678	Backhoe	2	40	50	78
Rubber Tired Dozers	815	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	815	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	65.7	69.7
Backhoe	61.7	55.7
Dozer	50.4	44.4
Backhoe	49.4	43.4
Dozer	48.8	42.8
Backhoe	44.8	38.8
Total [1]	**67.4**	**69.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	75.4	75.8	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Site Preparation - Mitigated Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Rubber Tired Dozers	683	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	683	Backhoe	1	40	50	78
Rubber Tired Dozers	1223	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	1223	Backhoe	2	40	50	78
Rubber Tired Dozers	418	Dozer	1	40	50	82
Tractors/Loaders/Backhoes	418	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Dozer	50.3	54.3
Backhoe	46.3	40.3
Dozer	45.3	39.2
Backhoe	44.3	38.2
Dozer	54.6	48.6
Backhoe	50.6	44.6
Total [1]	**57.9**	**54.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.6	67.3	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	168	Grader	0	40	50	85
Excavators	168	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	168	Backhoe	1	40	50	78
Scrapers	168	Scraper	1	40	50	84
Rubber Tired Dozers	168	Dozer	0	40	50	82
Graders	1206	Grader	1	40	50	85
Excavators	1206	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	1206	Backhoe	0	40	50	78
Scrapers	1206	Scraper	0	40	50	84
Rubber Tired Dozers	1206	Dozer	1	40	50	82
Graders	540	Grader	0	40	50	85
Excavators	540	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	540	Backhoe	1	40	50	78
Scrapers	540	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	51.5	55.5
Backhoe	48.5	52.5
Scraper	54.5	58.5
Dozer		
Grader	38.4	42.4
Excavator		
Backhoe		
Scraper		
Dozer	35.4	39.4
Grader		
Excavator	41.4	45.3
Backhoe	38.4	42.3
Scraper	44.4	48.3
Total [1]	**57.4**	**58.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.9	68.0	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	95	Grader	0	40	50	85
Excavators	95	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	95	Backhoe	1	40	50	78
Scrapers	95	Scraper	1	40	50	84
Rubber Tired Dozers	95	Dozer	0	40	50	82
Graders	735	Grader	1	40	50	85
Excavators	735	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	735	Backhoe	0	40	50	78
Scrapers	735	Scraper	0	40	50	84
Rubber Tired Dozers	735	Dozer	1	40	50	82
Graders	330	Grader	0	40	50	85
Excavators	330	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	330	Backhoe	1	40	50	78
Scrapers	300	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	56.4	60.4
Backhoe	53.4	57.4
Scraper	59.4	63.4
Dozer		
Grader	42.7	46.7
Excavator		
Backhoe		
Scraper		
Dozer	39.7	43.7
Grader		
Excavator	45.6	49.6
Backhoe	42.6	46.6
Scraper	49.5	53.4
Total [1]	**62.3**	**63.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	67.2	67.6	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	146	Grader	0	40	50	85
Excavators	146	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	146	Backhoe	1	40	50	78
Scrapers	146	Scraper	1	40	50	84
Rubber Tired Dozers	146	Dozer	0	40	50	82
Graders	422	Grader	1	40	50	85
Excavators	422	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	422	Backhoe	0	40	50	78
Scrapers	422	Scraper	0	40	50	84
Rubber Tired Dozers	422	Dozer	1	40	50	82
Graders	1010	Grader	0	40	50	85
Excavators	1010	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1010	Backhoe	1	40	50	78
Scrapers	1010	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	52.7	56.7
Backhoe	49.7	53.7
Scraper	55.7	59.7
Dozer		
Grader	47.5	51.5
Excavator		
Backhoe		
Scraper		
Dozer	44.5	48.5
Grader		
Excavator	35.9	39.9
Backhoe	32.9	36.9
Scraper	38.9	42.9
Total [1]	**58.8**	**59.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	75.0	75.0	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	102	Grader	0	40	50	85
Excavators	102	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	102	Backhoe	1	40	50	78
Scrapers	102	Scraper	1	40	50	84
Rubber Tired Dozers	102	Dozer	0	40	50	82
Graders	265	Grader	1	40	50	85
Excavators	265	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	265	Backhoe	0	40	50	78
Scrapers	265	Scraper	0	40	50	84
Rubber Tired Dozers	265	Dozer	1	40	50	82
Graders	1002	Grader	0	40	50	85
Excavators	1002	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1002	Backhoe	1	40	50	78
Scrapers	1002	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	55.8	59.8
Backhoe	52.8	56.8
Scraper	58.8	62.8
Dozer		
Grader	51.5	55.5
Excavator		
Backhoe		
Scraper		
Dozer	48.5	52.5
Grader		
Excavator	36.0	40.0
Backhoe	33.0	37.0
Scraper	39.0	43.0
Total [1]	**61.9**	**62.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	65.4	65.8	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	85	Grader	0	40	50	85
Excavators	85	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	85	Backhoe	1	40	50	78
Scrapers	85	Scraper	1	40	50	84
Rubber Tired Dozers	85	Dozer	0	40	50	82
Graders	405	Grader	1	40	50	85
Excavators	405	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	405	Backhoe	0	40	50	78
Scrapers	405	Scraper	0	40	50	84
Rubber Tired Dozers	405	Dozer	1	40	50	82
Graders	1055	Grader	0	40	50	85
Excavators	1055	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1055	Backhoe	1	40	50	78
Scrapers	1055	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	57.4	61.4
Backhoe	54.4	58.4
Scraper	60.4	64.4
Dozer		
Grader	47.9	51.8
Excavator		
Backhoe		
Scraper		
Dozer	44.9	48.8
Grader		
Excavator	35.5	39.5
Backhoe	32.5	36.5
Scraper	38.5	42.5
Total [1]	**63.1**	**64.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	67.0	67.6	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	133	Grader	0	40	50	85
Excavators	133	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	133	Backhoe	1	40	50	78
Scrapers	133	Scraper	1	40	50	84
Rubber Tired Dozers	133	Dozer	0	40	50	82
Graders	668	Grader	1	40	50	85
Excavators	668	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	668	Backhoe	0	40	50	78
Scrapers	668	Scraper	0	40	50	84
Rubber Tired Dozers	668	Dozer	1	40	50	82
Graders	1108	Grader	0	40	50	85
Excavators	1108	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	1108	Backhoe	1	40	50	78
Scrapers	1108	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	63.5	67.5
Backhoe	60.5	64.5
Scraper	66.5	70.5
Dozer		
Grader	53.5	57.5
Excavator		
Backhoe		
Scraper		
Dozer	50.5	54.5
Grader		
Excavator	45.1	49.1
Backhoe	42.1	46.1
Scraper	48.1	52.1
Total [1]	**69.2**	**70.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	72.5	73.2	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	116	Grader	0	40	50	85
Excavators	116	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	116	Backhoe	1	40	50	78
Scrapers	116	Scraper	1	40	50	84
Rubber Tired Dozers	116	Dozer	0	40	50	82
Graders	678	Grader	1	40	50	85
Excavators	678	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	678	Backhoe	0	40	50	78
Scrapers	678	Scraper	0	40	50	84
Rubber Tired Dozers	678	Dozer	1	40	50	82
Graders	815	Grader	0	40	50	85
Excavators	815	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	815	Backhoe	1	40	50	78
Scrapers	815	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Leve Dozer

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	64.7	68.7
Backhoe	61.7	65.7
Scraper	67.7	71.7
Dozer		
Grader	53.4	57.4
Excavator		
Backhoe		
Scraper		
Dozer	50.4	54.4
Grader		
Excavator	47.8	51.8
Backhoe	44.8	48.8
Scraper	50.8	54.8
Total [1]	**70.4**	**71.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	76.0	76.4	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime

La Brea Tar Pits Master Plan
Grading - Mitigated Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Graders	683	Grader	0	40	50	85
Excavators	683	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	683	Backhoe	1	40	50	78
Scrapers	683	Scraper	1	40	50	84
Rubber Tired Dozers	683	Dozer	0	40	50	82
Graders	1223	Grader	1	40	50	85
Excavators	1223	Excavator	0	40	50	81
Tractors/Loaders/Backhoes	1223	Backhoe	0	40	50	78
Scrapers	1223	Scraper	0	40	50	84
Rubber Tired Dozers	1223	Dozer	1	40	50	82
Graders	418	Grader	0	40	50	85
Excavators	418	Excavator	1	40	50	81
Tractors/Loaders/Backhoes	418	Backhoe	1	40	50	78
Scrapers	418	Scraper	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Le Dozer

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Grader		
Excavator	49.3	53.3
Backhoe	46.3	50.3
Scraper	52.3	56.3
Dozer		
Grader	48.3	52.2
Excavator		
Backhoe		
Scraper		
Dozer	45.3	49.2
Grader		
Excavator	53.6	57.6
Backhoe	50.6	54.6
Scraper	56.6	60.6
Total [1]	**60.8**	**60.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	68.0	68.0	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	820	Front End Loader	1	40	50	79
Generator Sets	820	Generator	0	50	50	81
Cranes	820	Crane	0	16	50	81
Welders	820	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	820	Backhoe	1	40	50	78
Forklifts	959	Front End Loader	1	40	50	79
Generator Sets	959	Generator	1	50	50	81
Cranes	959	Crane	1	16	50	81
Welders	959	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	959	Backhoe	1	40	50	78
Forklifts	540	Front End Loader	1	40	50	79
Generator Sets	540	Generator	0	50	50	81
Cranes	540	Crane	0	16	50	81
Tractors/Loaders/Backh	540	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	35.7	39.7
Generator		
Crane		
Welder/Torch		
Backhoe	34.7	38.7
Front End Loader	34.4	38.3
Generator	37.3	40.3
Crane	32.4	40.3
Welder/Torch	29.4	33.3
Backhoe	33.4	37.3
Front End Loader	39.4	43.3
Generator		
Crane		
Backhoe	38.4	42.3
Total [1]	**45.4**	**43.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.5	67.5	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	271	Front End Loader	1	40	50	79
Generator Sets	271	Generator	0	50	50	81
Cranes	271	Crane	0	16	50	81
Welders	271	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	271	Backhoe	1	40	50	78
Forklifts	735	Front End Loader	1	40	50	79
Generator Sets	735	Generator	1	50	50	81
Cranes	735	Crane	1	16	50	81
Welders	735	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	735	Backhoe	1	40	50	78
Forklifts	518	Front End Loader	1	40	50	79
Generator Sets	518	Generator	0	50	50	81
Cranes	518	Crane	0	16	50	81
Tractors/Loaders/Backh	518	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	45.3	49.3
Generator		
Crane		
Welder/Torch		
Backhoe	44.3	48.3
Front End Loader	36.7	40.7
Generator	39.6	42.7
Crane	34.7	42.7
Welder/Torch	31.7	35.7
Backhoe	35.7	39.7
Front End Loader	39.7	43.7
Generator		
Crane		
Backhoe	38.7	42.7
Total [1]	**50.0**	**49.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	65.6	65.6	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	683	Front End Loader	1	40	50	79
Generator Sets	683	Generator	0	50	50	81
Cranes	683	Crane	0	16	50	81
Welders	683	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	683	Backhoe	1	40	50	78
Forklifts	422	Front End Loader	1	40	50	79
Generator Sets	422	Generator	1	50	50	81
Cranes	422	Crane	1	16	50	81
Welders	422	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	422	Backhoe	1	40	50	78
Forklifts	565	Front End Loader	1	40	50	79
Generator Sets	565	Generator	0	50	50	81
Cranes	565	Crane	0	16	50	81
Tractors/Loaders/Backh	565	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	37.3	41.3
Generator		
Crane		
Welder/Torch		
Backhoe	36.3	40.3
Front End Loader	41.5	45.5
Generator	44.5	47.5
Crane	39.5	47.5
Welder/Torch	36.5	40.5
Backhoe	40.5	44.5
Front End Loader	39.0	42.9
Generator		
Crane		
Backhoe	38.0	41.9
Total [1]	**49.6**	**47.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	74.9	74.9	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	735	Front End Loader	1	40	50	79
Generator Sets	735	Generator	0	50	50	81
Cranes	735	Crane	0	16	50	81
Welders	735	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	735	Backhoe	1	40	50	78
Forklifts	265	Front End Loader	1	40	50	79
Generator Sets	265	Generator	1	50	50	81
Cranes	265	Crane	1	16	50	81
Welders	265	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	265	Backhoe	1	40	50	78
Forklifts	518	Front End Loader	1	40	50	79
Generator Sets	518	Generator	0	50	50	81
Cranes	518	Crane	0	16	50	81
Tractors/Loaders/Backh	518	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	36.7	40.7
Generator		
Crane		
Welder/Torch		
Backhoe	35.7	39.7
Front End Loader	45.5	49.5
Generator	48.5	51.5
Crane	43.6	51.5
Welder/Torch	40.5	44.5
Backhoe	44.5	48.5
Front End Loader	39.7	43.7
Generator		
Crane		
Backhoe	38.7	42.7
Total [1]	**52.9**	**51.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	63.2	63.1	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	890	Front End Loader	1	40	50	79
Generator Sets	890	Generator	0	50	50	81
Cranes	890	Crane	0	16	50	81
Welders	890	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	890	Backhoe	1	40	50	78
Forklifts	405	Front End Loader	1	40	50	79
Generator Sets	405	Generator	1	50	50	81
Cranes	405	Crane	1	16	50	81
Welders	405	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	405	Backhoe	1	40	50	78
Forklifts	636	Front End Loader	1	40	50	79
Generator Sets	636	Generator	0	50	50	81
Cranes	636	Crane	0	16	50	81
Tractors/Loaders/Backh	636	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	35.0	39.0
Generator		
Crane		
Welder/Torch		
Backhoe	34.0	38.0
Front End Loader	41.9	45.8
Generator	44.8	47.8
Crane	39.9	47.8
Welder/Torch	36.9	40.8
Backhoe	40.9	44.8
Front End Loader	37.9	41.9
Generator		
Crane		
Backhoe	36.9	40.9
Total [1]	**49.5**	**47.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	64.9	64.9	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	1038	Front End Loader	1	40	50	79
Generator Sets	1038	Generator	0	50	50	81
Cranes	1038	Crane	0	16	50	81
Welders	1038	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	1038	Backhoe	1	40	50	78
Forklifts	668	Front End Loader	1	40	50	79
Generator Sets	668	Generator	1	50	50	81
Cranes	668	Crane	1	16	50	81
Welders	668	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	668	Backhoe	1	40	50	78
Forklifts	798	Front End Loader	1	40	50	79
Generator Sets	798	Generator	0	50	50	81
Cranes	798	Crane	0	16	50	81
Tractors/Loaders/Backh	798	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	43.7	47.7
Generator		
Crane		
Welder/Torch		
Backhoe	42.7	46.7
Front End Loader	47.5	51.5
Generator	50.5	53.5
Crane	45.5	53.5
Welder/Torch	42.5	46.5
Backhoe	46.5	50.5
Front End Loader	46.0	49.9
Generator		
Crane		
Backhoe	45.0	48.9
Total [1]	**55.8**	**53.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	70.0	69.9	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	805	Front End Loader	1	40	50	79
Generator Sets	805	Generator	0	50	50	81
Cranes	805	Crane	0	16	50	81
Welders	805	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	805	Backhoe	1	40	50	78
Forklifts	678	Front End Loader	1	40	50	79
Generator Sets	678	Generator	1	50	50	81
Cranes	678	Crane	1	16	50	81
Welders	678	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	678	Backhoe	1	40	50	78
Forklifts	671	Front End Loader	1	40	50	79
Generator Sets	671	Generator	0	50	50	81
Cranes	671	Crane	0	16	50	81
Tractors/Loaders/Backh	671	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	45.9	49.9
Generator		
Crane		
Welder/Torch		
Backhoe	44.9	48.9
Front End Loader	47.4	51.4
Generator	50.3	53.4
Crane	45.4	53.4
Welder/Torch	42.4	46.4
Backhoe	46.4	50.4
Front End Loader	47.5	51.4
Generator		
Crane		
Backhoe	46.5	50.4
Total [1]	**56.3**	**53.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.7	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Building Construction - Mitigated Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Forklifts	660	Front End Loader	1	40	50	79
Generator Sets	660	Generator	0	50	50	81
Cranes	660	Crane	0	16	50	81
Welders	660	Welder/Torch	0	40	50	74
Tractors/Loaders/Backh	660	Backhoe	1	40	50	78
Forklifts	1223	Front End Loader	1	40	50	79
Generator Sets	1223	Generator	1	50	50	81
Cranes	1223	Crane	1	16	50	81
Welders	1223	Welder/Torch	1	40	50	74
Tractors/Loaders/Backh	1223	Backhoe	1	40	50	78
Forklifts	1031	Front End Loader	1	40	50	79
Generator Sets	1031	Generator	0	50	50	81
Cranes	1031	Crane	0	16	50	81
Tractors/Loaders/Backh	1031	Backhoe	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Front End Loader	47.6	51.6
Generator		
Crane		
Welder/Torch		
Backhoe	46.6	50.6
Front End Loader	42.3	46.2
Generator	45.2	48.2
Crane	40.3	48.2
Welder/Torch	37.3	41.2
Backhoe	41.3	45.2
Front End Loader	43.7	47.7
Generator		
Crane		
Backhoe	42.7	46.7
Total [1]	**53.5**	**51.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.3	67.2	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	1094	Paver	2	50	50	77
Roller	1094	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	35.2	38.2
Roller	34.2	41.2
Total [1]	**37.8**	**41.2**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.5	67.5	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	622	Paver	2	50	50	77
Roller	622	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	40.1	43.1
Roller	39.1	46.1
Total [1]	**42.7**	**46.1**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	65.5	65.5	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	338	Paver	2	50	50	77
Roller	338	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	45.4	48.4
Roller	44.4	51.4
Total [1]	**48.0**	**51.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	74.9	74.9	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	346	Paver	2	50	50	77
Roller	346	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	45.2	48.2
Roller	44.2	51.2
Total [1]	**47.7**	**51.2**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	62.9	63.1	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	571	Paver	2	50	50	77
Roller	571	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	40.8	43.9
Roller	39.9	46.9
Total [1]	**43.4**	**46.9**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	64.8	64.9	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	836	Paver	2	50	50	77
Roller	836	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	47.5	50.5
Roller	46.6	53.5
Total [1]	**50.1**	**53.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	69.8	69.9	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	824	Paver	2	50	50	77
Roller	824	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	47.7	50.7
Roller	46.7	53.7
Total [1]	**50.2**	**53.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.6	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Paving - Mitigated Construction
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Pavers	1264	Paver	2	50	50	77
Roller	1264	Roller	2	20	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Paver	43.9	47.0
Roller	43.0	50.0
Total [1]	**46.5**	**50.0**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.1	67.2	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	540	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	38.4	42.3
Total [1]	**38.4**	**42.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.5	67.5	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	271	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	44.3	48.3
Total [1]	**44.3**	**48.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	65.5	65.6	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	422	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	40.5	44.5
Total [1]	**40.5**	**44.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	74.9	74.9	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	265	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	44.5	48.5
Total [1]	**44.5**	**48.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	62.9	63.0	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	405	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	40.9	44.8
Total [1]	**40.9**	**44.8**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

[3] Assumes an estimated noise reduction of 10 dBA due to noise barrier/wall.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	64.8	64.8	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	668	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	46.5	50.5
Total [1]	**46.5**	**50.5**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	69.8	69.9	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	671	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	46.5	50.4
Total [1]	**46.5**	**50.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.6	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Architectural Coating - Construction Mitigated
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @
	feet			%/hr.	(feet)	(dBA)
Air Compressor	660	Compressor (air)	1	40	50	78

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2,3]	
	Leq (dBA)	L_{Max} (dBA)
Compressor (air)	46.6	50.6
Total [1]	**46.6**	**50.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Assumes an estimated noise shielding of 5 dBA

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.1	67.2	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

Construction Traffic Noise - Demolition

Station	Traffic values			Control	Road surface	Gradient
	Vehicles type	Veh/h	Speed km/h			Min / Max %
1 Traffic direction: In entry direction	Total	30	-	None	Average (of DGAC and PCC)	-0.9 / -0.1
	Automobiles	25	56			
	Medium trucks	1	56			
	Heavy trucks	4	56			
	Buses	-	56			
	Motorcycles	-	56			
	Auxiliary vehicle	-	-			

Construction Traffic Noise - Site Preparation

Station	Traffic values			Control	Road surface	Gradient
	Vehicles type	Veh/h	Speed km/h			Min / Max %
1 Traffic direction: In entry direction	Total	11	-	None	Average (of DGAC and PCC)	-0.9 / -0.1
	Automobiles	10	56			
	Medium trucks	-	56			
	Heavy trucks	1	56			
	Buses	-	56			
	Motorcycles	-	56			
	Auxiliary vehicle	-	-			

Construction Traffic Noise - Grading

Station	Traffic values			Control	Road surface	Gradient
	Vehicles type	Veh/h	Speed km/h			Min / Max %
1 Traffic direction: In entry direction	Total	69	-	None	Average (of DGAC and PCC)	-0.9 / -0.1
	Automobiles	38	56			
	Medium trucks	2	56			
	Heavy trucks	30	56			
	Buses	-	56			
	Motorcycles	-	56			
	Auxiliary vehicle	-	-			

Construction Traffic Noise - Building Construction

Station	Traffic values			Control	Road surface	Gradient
	Vehicles type	Veh/h	Speed km/h			Min / Max %
1 Traffic direction: In entry direction	Total	106	-	None	Average (of DGAC and PCC)	-0.9 / -0.1
	Automobiles	100	56			
	Medium trucks	3	56			
	Heavy trucks	4	56			
	Buses	-	56			
	Motorcycles	-	56			
	Auxiliary vehicle	-	-			

Construction Traffic Noise - Paving

Station	Traffic values			Control	Road surface	Gradient
	Vehicles type	Veh/h	Speed km/h			Min / Max %
1 Traffic direction: In entry direction	Total	10	-	None	Average (of DGAC and PCC)	-0.9 / -0.1
	Automobiles	8	56			
	Medium trucks	1	56			
	Heavy trucks	2	56			
	Buses	-	56			
	Motorcycles	-	56			
	Auxiliary vehicle	-	-			

Construction Traffic Noise - Architectural Coating

Station	Traffic values			Control	Road surface	Gradient
	Vehicles type	Veh/h	Speed km/h			Min / Max %
1 Traffic direction: In entry direction	Total	10	-	None	Average (of DGAC and PCC)	-0.9 / -0.1
	Automobiles	8	56			
	Medium trucks	1	56			
	Heavy trucks	2	56			
	Buses	-	56			
	Motorcycles	-	56			
	Auxiliary vehicle	-	-			

APPENDIX C

Operational Noise Calculations

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	951		6	100	3	73
Page Museum - HVAC	1213		10	100	3	73
Support Building - HVAC	711		1	100	3	73
New Museum Building - Emergency Generator	951	Generator	0	50	50	81
Page Museum - Emergency Generator	1213	Generator	0	50	50	81
Support Building - Emergency Generator	711	Generator	1	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.

[b] Assumes only one generator is operating simultaneously.

Sound Levels at NSA ST2

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	30.8	30.8
Page Museum - HVAC	30.9	30.9
Support Building - HVAC	25.5	25.5
Generator		
Generator		
Generator	49.9	52.9
Total [1]	**50.1**	**52.9**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.6	67.6	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	498		6	100	3	73
Page Museum - HVAC	772		10	100	3	73
Support Building - HVAC	247		1	100	3	73
New Museum Building - Emergency Generator	498	Generator	0	50	50	81
Page Museum - Emergency Generator	772	Generator	0	50	50	81
Support Building - Emergency Generator	247	Generator	1	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.
[b] Assumes only one generator is operating simultaneously.
[c] Assumes an estimated noise shielding of 5 dBA

Sound Levels at NSA ST3

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	36.4	36.4
Page Museum - HVAC	34.8	34.8
Support Building - HVAC	34.7	34.7
Generator		
Generator		
Generator	59.1	62.1
Total [1]	**59.2**	**62.1**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	66.4	67.1	65.5	65.5	Yes

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels.

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	561		6	100	3	73
Page Museum - HVAC	508		10	100	3	73
Support Building - HVAC	693		1	100	3	73
New Museum Building - Emergency Generator	561	Generator	0	50	50	81
Page Museum - Emergency Generator	508	Generator	1	50	50	81
Support Building - Emergency Generator	693	Generator	0	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.

[b] Assumes only one generator is operating simultaneously.

Sound Levels at NSA ST5

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	35.3	35.3
Page Museum - HVAC	38.4	38.4
Support Building - HVAC	25.7	25.7
Generator		
Generator	52.9	55.9
Generator		
Total [1]	**53.1**	**55.9**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	74.9	75.0	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	509		6	100	3	73
Page Museum - HVAC	313		8	100	3	73
Support Building - HVAC	730		1	100	3	73
New Museum Building - Emergency Generator	509	Generator	0	50	50	81
Page Museum - Emergency Generator	313	Generator	1	50	50	81
Support Building - Emergency Generator	730	Generator	0	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.

[b] Assumes only one generator is operating simultaneously.

Sound Levels at NSA ST6

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	36.2	36.2
Page Museum - HVAC	41.7	41.7
Support Building - HVAC	25.3	25.3
Generator		
Generator	57.1	60.1
Generator		
Total [1]	**57.2**	**60.1**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	63.9	64.7	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	614		6	100	3	73
Page Museum - HVAC	346		10	100	3	73
Support Building - HVAC	876		1	100	3	73
New Museum Building - Emergency Generator	614	Generator	0	50	50	81
Page Museum - Emergency Generator	346	Generator	1	50	50	81
Support Building - Emergency Generator	876	Generator	0	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.

[b] Assumes only one generator is operating simultaneously.

Sound Levels at NSA ST7

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	34.6	34.6
Page Museum - HVAC	41.8	41.8
Support Building - HVAC	23.7	23.7
Generator		
Generator	56.2	59.2
Generator		
Total [1]	**56.4**	**59.2**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	65.4	65.9	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	785		6	100	3	73
Page Museum - HVAC	565		10	100	3	73
Support Building - HVAC	1030		1	100	3	73
New Museum Building - Emergency Generator	785	Generator	0	50	50	81
Page Museum - Emergency Generator	565	Generator	1	50	50	81
Support Building - Emergency Generator	1030	Generator	0	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.

[b] Assumes only one generator is operating simultaneously.

Sound Levels at NSA ST8

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	32.4	32.4
Page Museum - HVAC	37.5	37.5
Support Building - HVAC	22.3	22.3
Generator		
Generator	51.9	54.9
Generator		
Total [1]	**52.1**	**54.9**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	69.9	69.9	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	677		6	100	3	73
Page Museum - HVAC	573		10	100	3	73
Support Building - HVAC	864		1	100	3	73
New Museum Building - Emergency Generator	677	Generator	0	50	50	81
Page Museum - Emergency Generator	573	Generator	1	50	50	81
Support Building - Emergency Generator	864	Generator	0	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.

[b] Assumes only one generator is operating simultaneously.

Sound Levels at NSA ST9

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	33.7	33.7
Page Museum - HVAC	37.4	37.4
Support Building - HVAC	23.8	23.8
Generator		
Generator	51.8	54.8
Generator		
Total [1]	**52.0**	**54.8**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.6	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Mechanical - Operation
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b,c]
	feet			%/hr.	(feet)	(dBA)
New Museum Building - HVAC	1024		6	100	3	73
Page Museum - HVAC	1158		10	100	3	73
Support Building - HVAC	983		1	100	3	73
New Museum Building - Emergency Generator	1024	Generator	0	50	50	81
Page Museum - Emergency Generator	1158	Generator	0	50	50	81
Support Building - Emergency Generator	983	Generator	1	50	50	81

[a] A reference noise level of 73 dBA at 3 feet was assumed for a 5 ton HVAC unit.
[b] Assumes only one generator is operating simultaneously.

Sound Levels at NSA ST10

Equipment	Construction Levels [1]	
	Leq (dBA)	L_{Max} (dBA)
New Museum Building - HVAC	30.1	30.1
Page Museum - HVAC	31.3	31.3
Support Building - HVAC	22.7	22.7
Generator		
Generator		
Generator	47.1	50.1
Total [1]	**47.3**	**50.1**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.1	67.2	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.
[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	1213		1	100	50	66
Waste Compactor - New Museum Building	930		1	100	50	66
Loading Dock - Page Museum	1213		1	100	50	71
Loading Dock - New Museum Building	930		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	38.3	38.3
Waste Compactor - New Museum Building	40.6	40.6
Loading Dock - Page Museum	43.3	43.3
Loading Dock - New Museum Building	45.6	45.6
Total [1]	**48.8**	**45.6**
Max 1-hr	**45.6**	**45.6**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	67.5	67.5	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	734		1	100	50	66
Waste Compactor - New Museum Building	460		1	100	50	66
Loading Dock - Page Museum	734		1	100	50	71
Loading Dock - New Museum Building	460		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	42.7	42.7
Waste Compactor - New Museum Building	46.7	46.7
Loading Dock - Page Museum	47.7	47.7
Loading Dock - New Museum Building	51.7	51.7
Total [1]	**54.4**	**51.7**
Max 1-hr	**51.7**	**51.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	65.7	65.7	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	338		1	100	50	66
Waste Compactor - New Museum Building	508		1	100	50	66
Loading Dock - Page Museum	338		1	100	50	71
Loading Dock - New Museum Building	508		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	49.4	49.4
Waste Compactor - Pit 91		
Waste Compactor - New Museum Building	45.9	45.9
Loading Dock - Page Museum	54.4	54.4
Loading Dock - Pit 91		
Loading Dock - New Museum Building	50.9	50.9
Total [1]	**57.2**	**54.4**
Max 1-hr	**54.4**	**54.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	74.9	74.9	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	248		1	100	50	66
Waste Compactor - New Museum Building	522		1	100	50	66
Loading Dock - Page Museum	248		1	100	50	71
Loading Dock - New Museum Building	522		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	52.1	52.1
Waste Compactor - Pit 91		
Waste Compactor - New Museum Building	45.6	45.6
Loading Dock - Page Museum	57.1	57.1
Loading Dock - Pit 91		
Loading Dock - New Museum Building	50.6	50.6
Total [1]	**59.2**	**57.1**
Max 1-hr	**57.1**	**57.1**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	63.8	63.8	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	432		1	100	50	66
Waste Compactor - New Museum Building	631		1	100	50	66
Loading Dock - Page Museum	432		1	100	50	71
Loading Dock - New Museum Building	631		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	47.3	47.3
Waste Compactor - Pit 91		
Waste Compactor - New Museum Building	44.0	44.0
Loading Dock - Page Museum	52.3	52.3
Loading Dock - Pit 91		
Loading Dock - New Museum Building	49.0	49.0
Total [1]	**55.1**	**52.3**
Max 1-hr	**52.3**	**52.3**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	65.0	65.0	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	689		1	100	50	66
Waste Compactor - New Museum Building	783		1	100	50	66
Loading Dock - Page Museum	689		1	100	50	71
Loading Dock - New Museum Building	783		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	43.2	43.2
Waste Compactor - Pit 91		
Waste Compactor - New Museum Building	42.1	42.1
Loading Dock - Page Museum	48.2	48.2
Loading Dock - Pit 91		
Loading Dock - New Museum Building	47.1	47.1
Total [1]	**51.9**	**48.2**
Max 1-hr	**48.2**	**48.2**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	69.8	69.8	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	722		1	100	50	66
Waste Compactor - New Museum Building	675		1	100	50	66
Loading Dock - Page Museum	722		1	100	50	71
Loading Dock - New Museum Building	675		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	42.8	42.8
Waste Compactor - Pit 91		
Waste Compactor - New Museum Building	43.4	43.4
Loading Dock - Page Museum	47.8	47.8
Loading Dock - Pit 91		
Loading Dock - New Museum Building	48.4	48.4
Total [1]	**52.3**	**48.4**
Max 1-hr	**48.4**	**48.4**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	74.6	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Loading and Trash Compactor - Operation
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance [a,b]
	feet			%/hr.	(feet)	(dBA)
Waste Compactor- Page Museum	1269		1	100	50	66
Waste Compactor - New Museum Building	1038		1	100	50	66
Loading Dock - Page Museum	1269		1	100	50	71
Loading Dock - New Museum Building	1038		1	100	50	71

[a] Waste Compactor noise level - British Standard BS 5228-1:2009, Table C8

[b] Loading Dock noise level - AES 2017 LACMA Building for the Permanent Collection

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Waste Compactor- Page Museum	37.9	37.9
Waste Compactor - Pit 91		
Waste Compactor - New Museum Building	39.7	39.7
Loading Dock - Page Museum	42.9	42.9
Loading Dock - Pit 91		
Loading Dock - New Museum Building	44.7	44.7
Total [1]	**48.1**	**44.7**
Max 1-hr	**44.7**	**44.7**

[1] Noise Level assumes all equipment is operating simultaneously.

[2] Represents the loudest individual noise generating source

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
	67.1	67.1	67.1	72.1	No

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST2

NSA #:	ST2

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.5

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	1189		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	1189		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a,b]	535		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91 [a,b]	535		48	100	3.28	62
Amplified Sound System	1189		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST2

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	35.2	35.2
Speaking, Normal Voice, Female - Roof Top Page Museum	32.2	32.2
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	37.6	37.6
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	34.6	34.6
Amplified Sound System	37.0	37.0
Total [1]	**42.7**	**37.6**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST2	67.5	67.5	67.5	72.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST3

NSA #:	ST3

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
65.5

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	764		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	764		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a,b]	316		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91 [a]	316		48	100	3.28	62
Amplified Sound System	764		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST3

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	39.0	39.0
Speaking, Normal Voice, Female - Roof Top Page Museum	36.0	36.0
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	42.1	42.1
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	39.1	39.1
Amplified Sound System	40.9	40.9
Total [1]	**46.9**	**42.1**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST3	65.6	65.5	65.5	70.5	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST5

NSA #:	ST5

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.9

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	488		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	488		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a,b]	976		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91 [a,b]	976		48	100	3.28	62
Amplified Sound System	488		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST5

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	42.9	42.9
Speaking, Normal Voice, Female - Roof Top Page Museum	39.9	39.9
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	32.3	32.3
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	29.3	29.3
Amplified Sound System	44.8	44.8
Total [1]	**47.9**	**44.8**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST5	74.9	74.9	74.9	79.9	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST6

NSA #:	ST6

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
62.8

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	310		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	310		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a,]	984		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	984		48	100	3.28	62
Amplified Sound System	310		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST6

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	46.9	46.9
Speaking, Normal Voice, Female - Roof Top Page Museum	43.9	43.9
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	32.3	32.3
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	29.3	29.3
Amplified Sound System	48.7	48.7
Total [1]	**51.8**	**48.7**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST6	63.1	63.0	62.8	67.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST7

NSA #:	ST7

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
64.8

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	352		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	352		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a,b]	1008		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91 [a]	1008		48	100	3.28	62
Amplified Sound System	352		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST7

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	45.8	45.8
Speaking, Normal Voice, Female - Roof Top Page Museum	42.8	42.8
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	32.1	32.1
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	29.1	29.1
Amplified Sound System	47.6	47.6
Total [1]	**50.7**	**47.6**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST7	65.0	64.9	64.8	69.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST8

NSA #:	ST8

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
69.8

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	580		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	580		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a]	1081		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	1081		48	100	3.28	62
Amplified Sound System	580		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST8

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	41.4	41.4
Speaking, Normal Voice, Female - Roof Top Page Museum	38.4	38.4
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	31.5	31.5
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	28.5	28.5
Amplified Sound System	43.3	43.3
Total [1]	**46.4**	**43.3**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST8	69.8	69.8	69.8	74.8	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST9

NSA #:	ST9

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
74.6

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	576		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	576		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a,b]	819		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91 [a,b]	819		48	100	3.28	62
Amplified Sound System	576		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST9

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	41.5	41.5
Speaking, Normal Voice, Female - Roof Top Page Museum	38.5	38.5
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	33.9	33.9
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	30.9	30.9
Amplified Sound System	43.3	43.3
Total [1]	**46.7**	**43.3**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST9	74.6	74.6	74.6	79.6	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

La Brea Tar Pits Master Plan
Outdoor Space - Operation
Noise Impact Assessment
NSA: ST10

NSA #:	ST10

Baseline Noise

Representative Existing Conditions
LAeq
(dBA)
67.1

Sources

Description	Distance to Receptor	Modeled As	Quantity [c]	Acoustical Usage Factor	Noise Level Reference Distance	Sound Pressure Level @ reference distance
	feet			%/hr.	(feet)	(dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum [a,b]	1165		137.5	100	3.28	65
Speaking, Normal Voice, Female - Roof Top Page Museum [a,b]	1165		137.5	100	3.28	62
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91 [a,b]	679		48	100	3.28	65
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91 [a,b]	679		48	100	3.28	62
Amplified Sound System	1165		1	100	15	75

[a] A reference sound power noise level of 65 dBA was assumed for 1 male speaking in a normal voice, or 62 dBA for one female speaking in a normal voice.

[b] It was assumed that 50% of the people would be talking at the same time.

[c] The estimated total number of people is based on 15 square feet per person.

Sound Levels at NSA ST10

Equipment	Construction Levels [1,2]	
	Leq (dBA)	L_{Max} (dBA)
Speaking, Normal Voice, Male - Roof Top Page Museum	35.4	35.4
Speaking, Normal Voice, Female - Roof Top Page Museum	32.4	32.4
Speaking, Normal Voice, Male - Outdoor Classroom Pit 10 and 91	35.5	35.5
Speaking, Normal Voice Female - Outdoor Classroom Pit 10 and 91	32.5	32.5
Amplified Sound System	37.2	37.2
Total [1]	**42.0**	**37.2**

[1] Noise Level assumes all equipment is operating simultaneously.

NSA #	Construction, Leq	Construction, Lmax [1]	Measured Ambient Noise Level, Leq	Significance Threshold, Leq [2]	Significant Impact?
	(dBA)	(dBA)	(dBA)	(dBA)	
ST10	67.1	67.1	67.1	72.1	No

[1] Calculated Lmax is the loudest individual value.

[2] Threshold is equivalent to the measured daytime ambient noise levels plus 5 dBA.

Existing Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction					
	Total	826	-	none	Average (of DGAC and PCC)
	Automobiles	809	56		
	Medium trucks	-	-		
	Heavy trucks	17	56		
	Buses	-	-		
	Motorcycles	-	-		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction					
	Total	844	-	none	Average (of DGAC and PCC)
	Automobiles	827	56		
	Medium trucks	-	56		
	Heavy trucks	17	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction					
	Total	809	-	none	Average (of DGAC and PCC)
	Automobiles	793	56		
	Medium trucks	-	56		
	Heavy trucks	16	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction					
	Total	812	-	none	Average (of DGAC and PCC)
	Automobiles	812	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction					
	Total	629	-	none	Average (of DGAC and PCC)
	Automobiles	628	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction					
	Total	627	-	none	Average (of DGAC and PCC)
	Automobiles	614	56		
	Medium trucks	-	56		
	Heavy trucks	13	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction					
	Total	619	-	none	Average (of DGAC and PCC)
	Automobiles	607	56		
	Medium trucks	-	56		
	Heavy trucks	12	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction					
	Total	543	-	none	Average (of DGAC and PCC)
	Automobiles	543	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	39	-	none	Average (of DGAC and PCC)
	Automobiles	38	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	19	-	none	Average (of DGAC and PCC)
	Automobiles	19	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	99	-	none	Average (of DGAC and PCC)
	Automobiles	97	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	2	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	130	-	none	Average (of DGAC and PCC)
	Automobiles	127	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	358	-		
	Automobiles	351	56		

Existing Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
	Medium trucks	-	56	none	Average (of DGAC and PCC)
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction					
	Total	354	-	none	Average (of DGAC and PCC)
	Automobiles	347	56		
	Medium trucks	-	56		
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction					
	Total	448	-	none	Average (of DGAC and PCC)
	Automobiles	439	56		
	Medium trucks	-	56		
	Heavy trucks	9	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction					
	Total	64	-	none	Average (of DGAC and PCC)
	Automobiles	63	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction					
	Total	361	-	none	Average (of DGAC and PCC)
	Automobiles	354	56		
	Medium trucks	-	56		
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	233	-	none	Average (of DGAC and PCC)
	Automobiles	228	56		
	Medium trucks	-	56		
	Heavy trucks	5	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	642	-	none	Average (of DGAC and PCC)
	Automobiles	629	56		
	Medium trucks	-	56		
	Heavy trucks	13	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	617	-	none	Average (of DGAC and PCC)
	Automobiles	605	56		
	Medium trucks	-	56		
	Heavy trucks	12	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Ogden Dr WB T Traffic direction: In entry direction					
	Total	1073	-	none	Average (of DGAC and PCC)
	Automobiles	1052	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Ogden Dr EB T Traffic direction: In entry direction					
	Total	956	-	none	Average (of DGAC and PCC)
	Automobiles	937	56		
	Medium trucks	-	56		
	Heavy trucks	19	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	534	-	none	Average (of DGAC and PCC)
	Automobiles	523	56		
	Medium trucks	-	56		
	Heavy trucks	11	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	553	-	none	Average (of DGAC and PCC)
	Automobiles	542	56		
	Medium trucks	-	56		
	Heavy trucks	11	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-6th Street NB W Traffic direction: In entry direction					
	Total	138	-	none	Average (of DGAC and PCC)
	Automobiles	135	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		

Existing Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-6th Street SB W Traffic direction: In entry direction					
	Total	134	-	none	Average (of DGAC and PCC)
	Automobiles	131	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street SB W Traffic direction: In entry direction					
	Total	51	-	none	Average (of DGAC and PCC)
	Automobiles	50	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street NB W Traffic direction: In entry direction					
	Total	30	-	none	Average (of DGAC and PCC)
	Automobiles	29	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction					
	Total	418	-	none	Average (of DGAC and PCC)
	Automobiles	410	56		
	Medium trucks	-	56		
	Heavy trucks	8	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street EB S Traffic direction: In entry direction					
	Total	199	-	none	Average (of DGAC and PCC)
	Automobiles	195	56		
	Medium trucks	-	56		
	Heavy trucks	4	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		
Ogden Dr-6th Street NB E Traffic direction: In entry direction					
	Total	145	-	none	Average (of DGAC and PCC)
	Automobiles	142	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-	-		

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	70.3	68.5	65.5	60.8	69.8
	Between Ogden Dr. and Curson Ave.	Residential	68.2	66.4	63.4	58.7	67.7
	East of Curson Ave.	Residential	68.2	66.4	63.4	58.7	67.7
Ogden Drive	North of 6th St.	Residential	61.3	59.5	56.5	51.8	60.8
	South of Wilshire Blvd.	Commercial	61.3	59.5	56.5	51.8	60.8
Spaulding Avenue	South of Wilshire Blvd.	Commercial	63.7	61.9	58.9	54.2	63.2
Curson Avenue	North of 6th St.	Residential	65.3	63.5	60.5	55.8	64.8
	Between 6th St. and Wilshire Blvd.	Residential	68.1	66.3	63.3	58.6	67.6
	South of Wilshire Blvd.	Residential	69.6	67.8	64.8	60.1	69.1
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	66.5	64.7	61.7	57.0	66.0
	Between Ogden Dr. and Spaulding Ave.	Commercial	65.6	63.8	60.8	56.1	65.1
	Between Spaulding. and Curson Ave.	Museum	67.5	65.7	62.7	58.0	67.0
	East of Curson Ave.	Commercial	66.3	64.5	61.5	56.8	65.8

Existing Roadway Traffic Noise Levels - Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction							
	Total	554	954	1594	-	none	Average (of DGAC and PCC)
	Automobiles	543	935	1562	56		
	Medium trucks	-	-	-	-		
	Heavy trucks	11	19	32	56		
	Buses	-	-	-	-		
	Motorcycles	-	-	-	-		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction							
	Total	561	961	1599	-	none	Average (of DGAC and PCC)
	Automobiles	550	942	1567	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	11	19	32	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction							
	Total	629	905	1591	-	none	Average (of DGAC and PCC)
	Automobiles	616	887	1559	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	13	18	32	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction							
	Total	742	942	1533	-	none	Average (of DGAC and PCC)
	Automobiles	742	942	1533	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction							
	Total	1164	675	663	-	none	Average (of DGAC and PCC)
	Automobiles	1163	673	661	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	2	2	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction							
	Total	1176	673	645	-	none	Average (of DGAC and PCC)
	Automobiles	1152	660	632	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	24	13	13	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1131	665	635	-	none	Average (of DGAC and PCC)
	Automobiles	1108	652	622	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	23	13	13	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction							
	Total	1021	640	681	-	none	Average (of DGAC and PCC)
	Automobiles	1021	640	681	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	9	24	53	-	none	Average (of DGAC and PCC)
	Automobiles	9	24	52	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	9	12	48	-	none	Average (of DGAC and PCC)
	Automobiles	9	12	47	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	115	65	78	-	none	Average (of DGAC and PCC)
	Automobiles	113	64	76	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	2	1	2	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	77	75	63	-	none	Average (of DGAC and PCC)
	Automobiles	75	74	62	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	549	300	323	-		
	Automobiles	538	294	317	56		

Existing Roadway Traffic Noise Levels - Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
	Medium trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Heavy trucks	11	6	6	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction							
	Total	382	264	352	-	none	Average (of DGAC and PCC)
	Automobiles	374	259	345	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	8	5	7	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction							
	Total	843	524	556	-	none	Average (of DGAC and PCC)
	Automobiles	826	514	545	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	17	10	11	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction							
	Total	104	82	82	-	none	Average (of DGAC and PCC)
	Automobiles	102	80	80	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	2	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction							
	Total	352	260	258	-	none	Average (of DGAC and PCC)
	Automobiles	345	255	253	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	7	5	5	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	324	157	245	-	none	Average (of DGAC and PCC)
	Automobiles	318	154	240	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	6	3	5	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1751	638	739	-	none	Average (of DGAC and PCC)
	Automobiles	1716	625	724	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	35	13	15	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1942	675	687	-	none	Average (of DGAC and PCC)
	Automobiles	1903	662	673	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	39	14	14	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Ogden Dr WB T Traffic direction: In entry direction							
	Total	1926	925	741	-	none	Average (of DGAC and PCC)
	Automobiles	1887	907	726	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	39	19	15	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Ogden Dr EB T Traffic direction: In entry direction							
	Total	500	768	910	-	none	Average (of DGAC and PCC)
	Automobiles	490	753	892	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	10	15	18	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	541	573	943	-	none	Average (of DGAC and PCC)
	Automobiles	530	562	924	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	11	11	19	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	607	610	1167	-	none	Average (of DGAC and PCC)
	Automobiles	595	598	1144	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	12	12	23	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-6th Street NB W Traffic direction: In entry direction							
	Total	166	129	213	-	none	Average (of DGAC and PCC)
	Automobiles	163	126	209	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	3	3	4	56		
	Buses	-	-	-	56		

Existing Roadway Traffic Noise Levels - Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-6th Street SB W Traffic direction: In entry direction							
	Total	269	122	171	-	none	Average (of DGAC and PCC)
	Automobiles	264	120	168	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	5	2	3	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street SB W Traffic direction: In entry direction							
	Total	90	24	37	-	none	Average (of DGAC and PCC)
	Automobiles	88	24	36	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street NB W Traffic direction: In entry direction							
	Total	26	19	45	-	none	Average (of DGAC and PCC)
	Automobiles	25	19	44	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction							
	Total	486	346	434	-	none	Average (of DGAC and PCC)
	Automobiles	476	339	425	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	10	7	9	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street EB S Traffic direction: In entry direction							
	Total	36	61	33	-	none	Average (of DGAC and PCC)
	Automobiles	35	60	32	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	1	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		
Ogden Dr-6th Street NB E Traffic direction: In entry direction							
	Total	8	76	114	-	none	Average (of DGAC and PCC)
	Automobiles	8	74	112	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	2	2	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-	-		

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	71.8	70.0	67.0	62.3	71.3
	Between Ogden Dr. and Curson Ave.	Residential	72.2	70.4	67.4	62.7	71.7
	East of Curson Ave.	Residential	71.5	69.7	66.7	62.0	71.0
Ogden Drive	North of 6th St.	Residential	63.1	61.3	58.3	53.6	62.6
	South of Wilshire Blvd.	Commercial	63.4	61.6	58.6	53.9	62.9
Spaulding Avenue	South of Wilshire Blvd.	Commercial	65.4	63.6	60.6	55.9	64.9
Curson Avenue	North of 6th St.	Residential	67.8	66.0	63.0	58.3	67.3
	Between 6th St. and Wilshire Blvd.	Residential	68.6	66.8	63.8	59.1	68.1
	South of Wilshire Blvd.	Residential	71.5	69.7	66.7	62.0	71.0
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	68.8	67.0	64.0	59.3	68.3
	Between Ogden Dr. and Spaulding Ave.	Commercial	67.7	65.9	62.9	58.2	67.2
	Between Spaulding. and Curson Ave.	Museum	69.9	68.1	65.1	60.4	69.4
	East of Curson Ave.	Commercial	68.3	66.5	63.5	58.8	67.8

Project Only Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction					
	Total	32	56	none	Average (of DGAC and PCC)
	Automobiles	31	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction					
	Total	32	56	none	Average (of DGAC and PCC)
	Automobiles	31	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction					
	Total	32	56	none	Average (of DGAC and PCC)
	Automobiles	31	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction					
	Total	27	56	none	Average (of DGAC and PCC)
	Automobiles	27	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction					
	Total	47	56	none	Average (of DGAC and PCC)
	Automobiles	47	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction					
	Total	47	56	none	Average (of DGAC and PCC)
	Automobiles	46	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction					
	Total	47	56	none	Average (of DGAC and PCC)
	Automobiles	46	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction					
	Total	13	56	none	Average (of DGAC and PCC)
	Automobiles	13	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	15	56	none	Average (of DGAC and PCC)
	Automobiles	15	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction					
	Total	32	56	none	Average (of DGAC and PCC)
	Automobiles	31	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Project Only Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction					
	Total	13	56	none	Average (of DGAC and PCC)
	Automobiles	13	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction					
	Total	59	56	none	Average (of DGAC and PCC)
	Automobiles	58	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	8	56	none	Average (of DGAC and PCC)
	Automobiles	8	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction					
	Total	58	56	none	Average (of DGAC and PCC)
	Automobiles	57	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction					
	Total	77	56	none	Average (of DGAC and PCC)
	Automobiles	75	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	8	56	none	Average (of DGAC and PCC)
	Automobiles	8	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	8	56	none	Average (of DGAC and PCC)
	Automobiles	8	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Project Only Roadway Traffic Noise Levels - Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction					
	Total	45	56		
	Automobiles	45	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-		none	Average (of DGAC and PCC)
Ogden Dr-6th Street EB S Traffic direction: In entry direction					
	Total	36	56		
	Automobiles	35	56		
	Medium trucks	-	56		
	Heavy trucks	1	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB E Traffic direction: In entry direction					
	Total	35	56		
	Automobiles	34	56		
	Medium trucks	-	56		
	Heavy trucks	1	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	58.2	56.4	53.4	48.7	57.7
	Between Ogden Dr. and Curson Ave.	Residential	45.4	43.6	40.6	35.9	44.9
	East of Curson Ave.	Residential	50.7	48.9	45.9	41.2	50.2
Ogden Drive	North of 6th St.	Residential	46.0	44.2	41.2	36.5	45.5
	South of Wilshire Blvd.	Commercial	48.2	46.4	43.4	38.7	47.7
Spaulding Avenue	South of Wilshire Blvd.	Commercial	50.4	48.6	45.6	40.9	49.9
Curson Avenue	North of 6th St.	Residential	48.3	46.5	43.5	38.8	47.8
	Between 6th St. and Wilshire Blvd.	Residential	58.5	56.7	53.7	49.0	58.0
	South of Wilshire Blvd.	Residential	56.4	54.6	51.6	46.9	55.9
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	53.4	51.6	48.6	43.9	52.9
	Between Ogden Dr. and Spaulding Ave.	Commercial	52.5	50.7	47.7	43.0	52.0
	Between Spaulding. and Curson Ave.	Museum	54.5	52.7	49.7	45.0	54.0
	East of Curson Ave.	Commercial	51.8	50.0	47.0	42.3	51.3

Description	Off-Site Receptor	Nearest Noise Land Use(s)	Coordinates		Leq	Daytime	Evening	Nighttime	CNEL
			X	Y	dBA	dBA	dBA	dBA	dBA
Multi-family residence on the north side of West 6th Street, northwest of the project site.	ST2	Multi-Family Residential	11374577.61	3770195.09	53.4	51.6	48.6	43.9	52.9
Multi-family residence on the north side of West 6th Street, northwest of the project site.	ST3	Multi-Family Residential	11374737.35	3770194.94	44.4	42.6	39.6	34.9	43.9
Multi-family residence on the north side of West 6th Street, northeast of the project site.	ST5	Multi-Family Residential	11374999.12	3770191.44	51.3	49.5	46.5	41.8	50.8
Multi-family residence on the east side of Curson Avenue, east of the project site.	ST6	Multi-Family Residential	11375004.59	3770097.23	54.6	52.8	49.8	45.1	54.1
Mixed-use commercial building on the east side of Curson Avenue, east of the project site.	ST7	Commercial	11375000.15	3769984.29	55.2	53.4	50.4	45.7	54.7
Office building on the south side of Wilshire Boulevard, southeast of the project site.	ST8	Commercial	11374965.74	3769888.53	55.2	53.4	50.4	45.7	54.7
Commercial building on the south side of Wilshire Boulevard, south of the project site.	ST9	Commercial	11374857.07	3769896.35	54.4	52.6	49.6	44.9	53.9
Commercial building on the south side of Wilshire Boulevard, southwest of the project site.	ST10	Commercial	11374597.98	3769921.79	52.8	51.0	48.0	43.3	52.3

Project Only Roadway Traffic Noise Levels - Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction							
	Total	3	24	4	56	none	Average (of DGAC and PCC)
	Automobiles	3	24	4	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction							
	Total	3	24	4	56	none	Average (of DGAC and PCC)
	Automobiles	3	24	4	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction							
	Total	3	24	4	56	none	Average (of DGAC and PCC)
	Automobiles	3	24	4	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction							
	Total	-	34	11	56	none	Average (of DGAC and PCC)
	Automobiles	-	34	11	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction							
	Total	-	67	23	56	none	Average (of DGAC and PCC)
	Automobiles	-	67	23	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	0	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction							
	Total	-	67	23	56	none	Average (of DGAC and PCC)
	Automobiles	-	66	23	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	1	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction							
	Total	-	67	24	56	none	Average (of DGAC and PCC)
	Automobiles	-	66	24	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	1	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction							
	Total	1	10	1	56	none	Average (of DGAC and PCC)
	Automobiles	1	10	1	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	-	-	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	-	-	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	-	-	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	-	-	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	-	16	5	56	none	Average (of DGAC and PCC)
	Automobiles	-	16	5	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	0	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction							
	Total	3	24	4	56	none	Average (of DGAC and PCC)
	Automobiles	3	24	4	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction							
	Total	-	-	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Project Only Roadway Traffic Noise Levels - Weekday

Station	Vehicles type	Traffic values AM Veh/h	midday Veh/h	PM Veh/h	Speed km/h	Control	Road surface
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction							
	Total	1	10	1	56		
	Automobiles	1	10	1	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction							
	Total	-	85	29	56		
	Automobiles	-	83	28	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	2	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1	6	1	56		
	Automobiles	1	6	1	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction							
	Total	-	82	29	56		
	Automobiles	-	80	28	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	2	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction							
	Total	6	57	8	56		
	Automobiles	6	56	8	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	1	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	-	12	4	56		
	Automobiles	-	12	4	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	-	12	4	56		
	Automobiles	-	12	4	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-		none	Average (of DGAC and PCC)
Ogden Dr-6th Street EB S Traffic direction: In entry direction							
	Total	3	27	4	56		
	Automobiles	3	26	4	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	1	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Project Only Roadway Traffic Noise Levels - Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Ogden Dr-6th Street NB E Traffic direction: In entry direction							
	Total	-	50	17	56	none	Average (of DGAC and PCC)
	Automobiles	-	49	17	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	1	0	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	58.7	56.9	53.9	49.2	58.2
	Between Ogden Dr. and Curson Ave.	Residential	46.8	45.0	42.0	37.3	46.3
	East of Curson Ave.	Residential	50.8	49.0	46.0	41.3	50.3
Ogden Drive	North of 6th St.	Residential	46.4	44.6	41.6	36.9	45.9
	South of Wilshire Blvd.	Commercial	48.6	46.8	43.8	39.1	48.1
Spaulding Avenue	South of Wilshire Blvd.	Commercial	50.8	49.0	46.0	41.3	50.3
Curson Avenue	North of 6th St.	Residential	49.1	47.3	44.3	39.6	48.6
	Between 6th St. and Wilshire Blvd.	Residential	57.6	55.8	52.8	48.1	57.1
	South of Wilshire Blvd.	Residential	56.8	55.0	52.0	47.3	56.3
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	53.6	51.8	48.8	44.1	53.1
	Between Ogden Dr. and Spaulding Ave.	Commercial	52.8	51.0	48.0	43.3	52.3
	Between Spaulding. and Curson Ave.	Museum	54.6	52.8	49.8	45.1	54.1
	East of Curson Ave.	Commercial	52.3	50.5	47.5	42.8	51.8

Description	Off-Site Receptor	Nearest Noise Land Use(s)	Coordinates		Leq	Daytime	Evening	Nighttime	CNEL
			X	Y	dBA	dBA	dBA	dBA	dBA
Multi-family residence on the north side of West 6th Street, northwest of the project site.	ST2	Multi-Family Residential	11374577.61	3770195.09	52.9	51.1	48.1	43.4	52.4
Multi-family residence on the north side of West 6th Street, northwest of the project site.	ST3	Multi-Family Residential	11374737.35	3770194.94	42.9	41.1	38.1	33.4	42.4
Multi-family residence on the north side of West 6th Street, northeast of the project site.	ST5	Multi-Family Residential	11374999.12	3770191.44	51.1	49.3	46.3	41.6	50.6
Multi-family residence on the east side of Curson Avenue, east of the project site.	ST6	Multi-Family Residential	11375004.59	3770097.23	54.9	53.1	50.1	45.4	54.4
Mixed-use commercial building on the east side of Curson Avenue, east of the project site.	ST7	Commercial	11375000.15	3769984.29	55.3	53.5	50.5	45.8	54.8
Office building on the south side of Wilshire Boulevard, southeast of the project site.	ST8	Commercial	11374965.74	3769888.53	54.6	52.8	49.8	45.1	54.1
Commercial building on the south side of Wilshire Boulevard, south of the project site.	ST9	Commercial	11374857.07	3769896.35	54.3	52.5	49.5	44.8	53.8
Commercial building on the south side of Wilshire Boulevard, southwest of the project site.	ST10	Commercial	11374597.98	3769921.79	52.5	50.7	47.7	43.0	52.0

Roadway Traffic Noise Levels - Related Projects Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction					
	Total	113	56	none	Average (of DGAC and PCC)
	Automobiles	111	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction					
	Total	109	56	none	Average (of DGAC and PCC)
	Automobiles	107	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction					
	Total	109	56	none	Average (of DGAC and PCC)
	Automobiles	107	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction					
	Total	330	56	none	Average (of DGAC and PCC)
	Automobiles	330	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction					
	Total	229	56	none	Average (of DGAC and PCC)
	Automobiles	228	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction					
	Total	225	56	none	Average (of DGAC and PCC)
	Automobiles	221	56		
	Medium trucks	-	56		
	Heavy trucks	5	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction					
	Total	225	56	none	Average (of DGAC and PCC)
	Automobiles	221	56		
	Medium trucks	-	56		
	Heavy trucks	5	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction					
	Total	31	56	none	Average (of DGAC and PCC)
	Automobiles	31	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	8	56	none	Average (of DGAC and PCC)
	Automobiles	8	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	8	56	none	Average (of DGAC and PCC)
	Automobiles	8	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	674	56	none	Average (of DGAC and PCC)
	Automobiles	661	56		
	Medium trucks	-	56		
	Heavy trucks	13	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction					
	Total	337	56	none	Average (of DGAC and PCC)
	Automobiles	330	56		
	Medium trucks	-	56		
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Traffic Noise Levels - Related Projects Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction					
	Total	30	56	none	Average (of DGAC and PCC)
	Automobiles	29	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction					
	Total	80	56	none	Average (of DGAC and PCC)
	Automobiles	78	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	1	56	none	Average (of DGAC and PCC)
	Automobiles	1	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	6	56	none	Average (of DGAC and PCC)
	Automobiles	6	56		
	Medium trucks	-	56		
	Heavy trucks	0	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	180	56	none	Average (of DGAC and PCC)
	Automobiles	176	56		
	Medium trucks	-	56		
	Heavy trucks	4	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction					
	Total	201	56	none	Average (of DGAC and PCC)
	Automobiles	197	56		
	Medium trucks	-	56		
	Heavy trucks	4	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction					
	Total	99	56	none	Average (of DGAC and PCC)
	Automobiles	97	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	84	56	none	Average (of DGAC and PCC)
	Automobiles	82	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	167	56	none	Average (of DGAC and PCC)
	Automobiles	164	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction					
	Total	-	56	none	Average (of DGAC and PCC)
	Automobiles	-	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Traffic Noise Levels - Related Projects Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction					
	Total	337	56		
	Automobiles	330	56		
	Medium trucks	-	56		
	Heavy trucks	7	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-		none	Average (of DGAC and PCC)
Ogden Dr-6th Street EB S Traffic direction: In entry direction					
	Total	20	56		
	Automobiles	20	56		
	Medium trucks	-	56		
	Heavy trucks	0	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB E Traffic direction: In entry direction					
	Total	26	56		
	Automobiles	25	56		
	Medium trucks	-	56		
	Heavy trucks	1	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	62.4	60.6	57.6	52.9	61.9
	Between Ogden Dr. and Curson Ave.	Residential	62.2	60.4	57.4	52.7	61.7
	East of Curson Ave.	Residential	59.4	57.6	54.6	49.9	58.9
Ogden Drive	North of 6th St.	Residential	51.3	49.5	46.5	41.8	50.8
	South of Wilshire Blvd.	Commercial	54.7	52.9	49.9	45.2	54.2
Spaulding Avenue	South of Wilshire Blvd.	Commercial	56.6	54.8	51.8	47.1	56.1
Curson Avenue	North of 6th St.	Residential	57.3	55.5	52.5	47.8	56.8
	Between 6th St. and Wilshire Blvd.	Residential	65.7	63.9	60.9	56.2	65.2
	South of Wilshire Blvd.	Residential	64.6	62.8	59.8	55.1	64.1
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	59.6	57.8	54.8	50.1	59.1
	Between Ogden Dr. and Spaulding Ave.	Commercial	58.7	56.9	53.9	49.2	58.2
	Between Spaulding. and Curson Ave.	Museum	60.6	58.8	55.8	51.1	60.1
	East of Curson Ave.	Commercial	61.0	59.2	56.2	51.5	60.5

Roadway Traffic Noise Levels - Related Projects Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction							
	Total	952	1182	1923	56		
	Automobiles	933	1158	1885	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	24	38	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction							
	Total	333	126	164	56		
	Automobiles	326	123	161	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	7	3	3	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction							
	Total	333	126	164	56		
	Automobiles	326	123	161	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	7	3	3	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction							
	Total	955	389	504	56		
	Automobiles	955	389	504	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction							
	Total	117	268	347	56		
	Automobiles	117	267	346	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	1	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction							
	Total	120	265	340	56		
	Automobiles	118	260	333	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	5	7	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction							
	Total	128	265	340	56		
	Automobiles	125	260	333	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	3	5	7	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction							
	Total	73	36	42	56		
	Automobiles	73	36	42	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	10	6	3	56		
	Automobiles	10	6	3	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	9	-	-	56		
	Automobiles	9	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	328	798	1035	56		
	Automobiles	321	782	1014	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	7	16	21	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction							
	Total	82	399	517	56		
	Automobiles	80	391	507	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	8	10	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction							
	Total	73	36	42	56		
	Automobiles	72	35	41	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	1	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Traffic Noise Levels - Related Projects Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction							
	Total	423	95	123	56		
	Automobiles	415	93	121	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	8	2	2	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	1	2	2	56		
	Automobiles	1	2	2	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	7	6	6	56		
	Automobiles	7	6	6	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	49	212	273	56		
	Automobiles	48	208	268	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	4	5	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction							
	Total	47	228	301	56		
	Automobiles	46	223	295	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	5	6	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction							
	Total	453	111	133	56		
	Automobiles	444	109	130	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	9	2	3	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	430	99	128	56		
	Automobiles	421	97	125	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	9	2	3	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	47	197	255	56		
	Automobiles	46	193	250	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	4	5	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction							
	Total	-	-	-	56		
	Automobiles	-	-	-	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction							
	Total	82	399	517	56		
	Automobiles	80	391	507	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	8	10	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-		none	Average (of DGAC and PCC)
Ogden Dr-6th Street EB S Traffic direction: In entry direction							
	Total	26	16	9	56		
	Automobiles	25	16	9	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	0	0	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Traffic Noise Levels - Related Projects Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Ogden Dr-6th Street NB E Traffic direction: In entry direction							
	Total	1	20	32	56	none	Average (of DGAC and PCC)
	Automobiles	1	20	31	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	1	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	64.1	62.3	59.3	54.6	63.6
	Between Ogden Dr. and Curson Ave.	Residential	64.0	62.2	59.2	54.5	63.5
	East of Curson Ave.	Residential	61.2	59.4	56.4	51.7	60.7
Ogden Drive	North of 6th St.	Residential	53.1	51.3	48.3	43.6	52.6
	South of Wilshire Blvd.	Commercial	57.9	56.1	53.1	48.4	57.4
Spaulding Avenue	South of Wilshire Blvd.	Commercial	58.5	56.7	53.7	49.0	58.0
Curson Avenue	North of 6th St.	Residential	59.6	57.8	54.8	50.1	59.1
	Between 6th St. and Wilshire Blvd.	Residential	67.6	65.8	62.8	58.1	67.1
	South of Wilshire Blvd.	Residential	66.5	64.7	61.7	57.0	66.0
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	68.7	66.9	63.9	59.2	68.2
	Between Ogden Dr. and Spaulding Ave.	Commercial	60.9	59.1	56.1	51.4	60.4
	Between Spaulding. and Curson Ave.	Museum	63.3	61.5	58.5	53.8	62.8
	East of Curson Ave.	Commercial	64.8	63.0	60.0	55.3	64.3

Roadway Traffic Noise Levels - Opening Year without Project Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction					
	Total	1025	56	none	Average (of DGAC and PCC)
	Automobiles	1005	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction					
	Total	1041	56	none	Average (of DGAC and PCC)
	Automobiles	1020	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction					
	Total	1003	56	none	Average (of DGAC and PCC)
	Automobiles	983	56		
	Medium trucks	-	56		
	Heavy trucks	20	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction					
	Total	1227	56	none	Average (of DGAC and PCC)
	Automobiles	1227	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction					
	Total	924	56	none	Average (of DGAC and PCC)
	Automobiles	923	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction					
	Total	918	56	none	Average (of DGAC and PCC)
	Automobiles	900	56		
	Medium trucks	-	56		
	Heavy trucks	18	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction					
	Total	909	56	none	Average (of DGAC and PCC)
	Automobiles	891	56		
	Medium trucks	-	56		
	Heavy trucks	18	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction					
	Total	631	56	none	Average (of DGAC and PCC)
	Automobiles	631	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	51	56	none	Average (of DGAC and PCC)
	Automobiles	50	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	29	56	none	Average (of DGAC and PCC)
	Automobiles	28	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	109	56	none	Average (of DGAC and PCC)
	Automobiles	107	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	2	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	144	56	none	Average (of DGAC and PCC)
	Automobiles	141	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	1069	56	none	Average (of DGAC and PCC)
	Automobiles	1048	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction					
	Total	728	56	none	Average (of DGAC and PCC)
	Automobiles	713	56		
	Medium trucks	-	56		
	Heavy trucks	15	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Traffic Noise Levels - Opening Year without Project Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction					
	Total	525	56	none	Average (of DGAC and PCC)
	Automobiles	515	56		
	Medium trucks	-	56		
	Heavy trucks	11	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction					
	Total	71	56	none	Average (of DGAC and PCC)
	Automobiles	70	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction					
	Total	479	56	none	Average (of DGAC and PCC)
	Automobiles	469	56		
	Medium trucks	-	56		
	Heavy trucks	10	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	259	56	none	Average (of DGAC and PCC)
	Automobiles	254	56		
	Medium trucks	-	56		
	Heavy trucks	5	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	716	56	none	Average (of DGAC and PCC)
	Automobiles	702	56		
	Medium trucks	-	56		
	Heavy trucks	14	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	1342	56	none	Average (of DGAC and PCC)
	Automobiles	1315	56		
	Medium trucks	-	56		
	Heavy trucks	27	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction					
	Total	1386	56	none	Average (of DGAC and PCC)
	Automobiles	1358	56		
	Medium trucks	-	56		
	Heavy trucks	28	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction					
	Total	1155	56	none	Average (of DGAC and PCC)
	Automobiles	1132	56		
	Medium trucks	-	56		
	Heavy trucks	23	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	1081	56	none	Average (of DGAC and PCC)
	Automobiles	1059	56		
	Medium trucks	-	56		
	Heavy trucks	22	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	777	56	none	Average (of DGAC and PCC)
	Automobiles	761	56		
	Medium trucks	-	56		
	Heavy trucks	16	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction					
	Total	153	56	none	Average (of DGAC and PCC)
	Automobiles	150	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction					
	Total	148	56	none	Average (of DGAC and PCC)
	Automobiles	145	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction					
	Total	57	56	none	Average (of DGAC and PCC)
	Automobiles	56	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction					
	Total	34	56	none	Average (of DGAC and PCC)
	Automobiles	33	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Traffic Noise Levels - Opening Year without Project Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction					
	Total	799	56		
	Automobiles	783	56		
	Medium trucks	-	56		
	Heavy trucks	16	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-		none	Average (of DGAC and PCC)
Ogden Dr-6th Street EB S Traffic direction: In entry direction					
	Total	239	56		
	Automobiles	234	56		
	Medium trucks	-	56		
	Heavy trucks	5	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB E Traffic direction: In entry direction					
	Total	186	56		
	Automobiles	182	56		
	Medium trucks	-	56		
	Heavy trucks	4	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	71.4	69.6	66.6	61.9	70.9
	Between Ogden Dr. and Curson Ave.	Residential	71.4	69.6	66.6	61.9	70.9
	East of Curson Ave.	Residential	69.4	67.6	64.6	59.9	68.9
Ogden Drive	North of 6th St.	Residential	62.7	60.9	57.9	53.2	62.2
	South of Wilshire Blvd.	Commercial	62.5	60.7	57.7	53.0	62.0
Spaulding Avenue	South of Wilshire Blvd.	Commercial	64.8	63.0	60.0	55.3	64.3
Curson Avenue	North of 6th St.	Residential	67.3	65.5	62.5	57.8	66.8
	Between 6th St. and Wilshire Blvd.	Residential	70.4	68.6	65.6	60.9	69.9
	South of Wilshire Blvd.	Residential	71.1	69.3	66.3	61.6	70.6
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	67.6	65.8	62.8	58.1	67.1
	Between Ogden Dr. and Spaulding Ave.	Commercial	66.8	65.0	62.0	57.3	66.3
	Between Spaulding. and Curson Ave.	Museum	68.7	66.9	63.9	59.2	68.2
	East of Curson Ave.	Commercial	67.8	66.0	63.0	58.3	67.3

Roadway Traffic Noise Levels - Opening Year without Project Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction							
	Total	952	1182	1923	56		
	Automobiles	933	1158	1885	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	24	38	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction							
	Total	952	1187	1930	56		
	Automobiles	933	1163	1891	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	24	39	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction							
	Total	945	1167	1936	56		
	Automobiles	926	1144	1897	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	23	39	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction							
	Total	1775	1429	2197	56		
	Automobiles	1775	1429	2197	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction							
	Total	1403	1014	1079	56		
	Automobiles	1401	1012	1076	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	3	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction							
	Total	1418	1009	1052	56		
	Automobiles	1390	989	1031	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	28	20	21	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1369	1000	1041	56		
	Automobiles	1342	980	1020	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	27	20	21	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction							
	Total	1201	744	794	56		
	Automobiles	1201	744	794	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	10	34	69	56		
	Automobiles	10	33	68	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	1	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	20	19	56	56		
	Automobiles	20	19	55	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	127	72	86	56		
	Automobiles	124	71	84	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	3	1	2	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	85	83	69	56		
	Automobiles	83	81	68	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	934	1129	1392	56		
	Automobiles	915	1106	1364	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	23	28	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction							
	Total	504	691	906	56		
	Automobiles	494	677	888	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	10	14	18	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction							
	Total	1003	613	654	56		
	Automobiles	983	601	641	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	20	12	13	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Traffic Noise Levels - Opening Year without Project Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction							
	Total	115	91	91	56		
	Automobiles	113	89	89	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	2	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction							
	Total	812	383	408	56		
	Automobiles	796	375	400	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	16	8	8	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	359	176	272	56		
	Automobiles	352	172	267	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	7	4	5	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1941	712	822	56		
	Automobiles	1902	698	806	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	39	14	16	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	2184	1224	1041	56		
	Automobiles	2140	1200	1020	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	44	24	21	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction							
	Total	2175	1238	1120	56		
	Automobiles	2132	1213	1098	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	44	25	22	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction							
	Total	1006	989	1139	56		
	Automobiles	986	969	1116	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	20	20	23	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	1003	971	1174	56		
	Automobiles	983	952	1151	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	20	19	23	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	728	871	1544	56		
	Automobiles	713	854	1513	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	15	17	31	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction							
	Total	183	143	235	56		
	Automobiles	179	140	230	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	4	3	5	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction							
	Total	297	135	189	56		
	Automobiles	291	132	185	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	6	3	4	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction							
	Total	100	26	41	56		
	Automobiles	98	25	40	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	1	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction							
	Total	29	21	50	56		
	Automobiles	28	21	49	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	0	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction							
	Total	650	688	994	56		
	Automobiles	637	674	974	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	13	14	20	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street EB S Traffic direction: In entry direction							
	Total	66	113	45	56		
	Automobiles	65	111	44	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	1	2	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Traffic Noise Levels - Opening Year without Project Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Ogden Dr-6th Street NB E Traffic direction: In entry direction							
	Total	10	104	158	56	none	Average (of DGAC and PCC)
	Automobiles	10	102	155	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	2	3	56		
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	72.7	70.9	67.9	63.2	72.2
	Between Ogden Dr. and Curson Ave.	Residential	73.0	71.2	68.2	63.5	72.5
	East of Curson Ave.	Residential	72.1	70.3	67.3	62.6	71.6
Ogden Drive	North of 6th St.	Residential	63.9	62.1	59.1	54.4	63.4
	South of Wilshire Blvd.	Commercial	64.6	62.8	59.8	55.1	64.1
Spaulding Avenue	South of Wilshire Blvd.	Commercial	66.6	64.8	61.8	57.1	66.1
Curson Avenue	North of 6th St.	Residential	68.8	67.0	64.0	59.3	68.3
	Between 6th St. and Wilshire Blvd.	Residential	71.0	69.2	66.2	61.5	70.5
	South of Wilshire Blvd.	Residential	73.0	71.2	68.2	63.5	72.5
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	69.8	68.0	65.0	60.3	69.3
	Between Ogden Dr. and Spaulding Ave.	Commercial	68.9	67.1	64.1	59.4	68.4
	Between Spaulding. and Curson Ave.	Museum	71.0	69.2	66.2	61.5	70.5
	East of Curson Ave.	Commercial	69.7	67.9	64.9	60.2	69.2

Mechanical Equipment Noise Calculations

Off-Site Receptor	Estimated Noise Levels from Mechanical Equipment				
	L_{eq}	CNEL[a]	Ld	Le	Ln
	dBA	dBA	dBA	dBA	dBA
ST2	50.1	51.3	50.1	50.1	40.6
ST3	59.2	60.4	59.2	59.2	49.7
ST5	53.1	54.3	53.1	53.1	43.6
ST6	57.2	58.4	57.2	57.2	47.7
ST7	56.4	57.6	56.4	56.4	46.9
ST8	52.1	53.3	52.1	52.1	42.6
ST9	52.0	53.2	52.0	52.0	42.5
ST10	47.3	48.5	47.3	47.3	37.8

[a] Assumes a daily operation from 6:00 a.m. to 10:00 p.m.

Off-Site Receptor	Ambient	Ambient plus Project	Increase	Ambient	Ambient plus Project	Increase
	L_{eq}	L_{eq}	L_{eq}	CNEL	CNEL	CNEL
	dBA	dBA	dBA	dBA	dBA	dBA
ST2	67.5	67.6	0.1	68.1	68.2	0.1
ST3	65.5	66.4	0.9	66.4	67.4	1.0
ST5	74.9	74.9	0.0	75.1	75.1	0.0
ST6	62.8	63.9	1.1	64.4	65.4	1.0
ST7	64.8	65.4	0.6	65.9	66.5	0.6
ST8	69.8	69.9	0.1	70.2	70.3	0.1
ST9	74.6	74.6	0.0	74.8	74.8	0.0
ST10	67.1	67.1	0.0	67.8	67.9	0.1

Traffic Noise Calculations

Off-Site Receptor	Estimated Traffic Noise Levels, CNEL			
	Project Only	Existing	Project plus Existing	Increase
	dBA	dBA	dBA	dBA
ST2	52.9	68.1	68.2	0.1
ST3	43.9	66.4	66.4	0.0
ST5	50.8	75.1	75.1	0.0
ST6	54.1	64.4	64.8	0.4
ST7	54.7	65.9	66.2	0.3
ST8	54.7	70.2	70.3	0.1
ST9	53.9	74.8	74.8	0.0
ST10	52.3	67.8	67.9	0.1

Loading and Trash Compactor Activities Noise Calculations

Off-Site Receptor	Estimated Noise Levels from Loading and Trash Compactor Activities				
	L_{eq}	CNEL [a]	Ld [b]	Le [b]	Ln [a]
	dBA	dBA	dBA	dBA	dBA
ST2	48.8	46.0	42.8	48.8	0.0
ST3	54.4	51.6	48.4	54.4	0.0
ST5	57.2	54.4	51.2	57.2	0.0
ST6	59.2	56.4	53.2	59.2	0.0
ST7	55.1	52.3	49.1	55.1	0.0
ST8	51.9	49.1	45.9	51.9	0.0
ST9	52.3	49.5	46.3	52.3	0.0
ST10	48.1	45.3	42.1	48.1	0.0

[a] Assumes a daily operation from 7:00 a.m. to 10:00 p.m.

[b] Loading and trash compactor activities will occur a maximum of 3 hours per day.

Off-Site Receptor	Ambient	Ambient plus Project	Increase	Ambient	Ambient plus Project	Increase
	L_{eq}	L_{eq}	L_{eq}	CNEL	CNEL	CNEL
	dBA	dBA	dBA	dBA	dBA	dBA
ST2	67.5	67.6	0.1	68.1	68.1	0.0
ST3	65.5	65.8	0.3	66.4	66.5	0.1
ST5	74.9	75.0	0.1	75.1	75.1	0.0
ST6	62.8	64.4	1.6	64.4	65.0	0.6
ST7	64.8	65.2	0.4	65.9	66.1	0.2
ST8	69.8	69.9	0.1	70.2	70.2	0.0
ST9	74.6	74.6	0.0	74.8	74.8	0.0
ST10	67.1	67.1	0.1	67.8	67.8	0.0

Parking Noise Calculations

Off-Site Receptor	Estimated Noise Levels from Parking				
	L_{eq}	CNEL[a]	Ld	Le	Ln
	dBA	dBA	dBA	dBA	dBA
ST2	29.0	30.2	29.0	29.0	19.5
ST3	37.1	38.3	37.1	37.1	27.6
ST5	42.2	43.4	42.2	42.2	32.7
ST6	43.8	45.0	43.8	43.8	34.3
ST7	33.4	34.6	33.4	33.4	23.9
ST8	26.2	27.4	26.2	26.2	16.7
ST9	28.2	29.4	28.2	28.2	18.7
ST10	24.5	25.7	24.5	24.5	15.0

[a] Assumes a daily operation from 6:00 a.m. to 10:00 p.m.

Off-Site Receptor	Ambient	Ambient plus Project	Increase	Ambient	Ambient plus Project	Increase
	L_{eq}	L_{eq}	L_{eq}	CNEL	CNEL	CNEL
	dBA	dBA	dBA	dBA	dBA	dBA
ST2	67.5	67.5	0.0	68.1	68.1	0.0
ST3	65.5	65.5	0.0	66.4	66.4	0.0
ST5	74.9	74.9	0.0	75.1	75.1	0.0
ST6	62.8	62.9	0.1	64.4	64.4	0.0
ST7	64.8	64.8	0.0	65.9	65.9	0.0
ST8	69.8	69.8	0.0	70.2	70.2	0.0
ST9	74.6	74.6	0.0	74.8	74.8	0.0
ST10	67.1	67.1	0.0	67.8	67.8	0.0

Outdoor Activities Noise Calculations

Off-Site Receptor	Estimated Noise Levels from Outdoor Activities				
	L_{eq}	CNEL[a]	Ld	Le	Ln
	dBA	dBA	dBA	dBA	dBA
ST2	42.7	39.7	42.7	0.0	0.0
ST3	46.9	43.9	46.9	0.0	0.0
ST5	47.9	44.9	47.9	0.0	0.0
ST6	51.8	48.8	51.8	0.0	0.0
ST7	50.7	47.7	50.7	0.0	0.0
ST8	46.4	43.4	46.4	0.0	0.0
ST9	46.7	43.7	46.7	0.0	0.0
ST10	42.0	39.0	42.0	0.0	0.0

[a] Assumes a daily operation from 7:00 a.m. to 7:00 p.m.

Off-Site Receptor	Ambient	Ambient plus Project	Increase	Ambient	Ambient plus Project	Increase
	L_{eq}	L_{eq}	L_{eq}	CNEL	CNEL	CNEL
	dBA	dBA	dBA	dBA	dBA	dBA
ST2	67.5	67.5	0.0	68.1	68.1	0.0
ST3	65.5	65.6	0.1	66.4	66.4	0.0
ST5	74.9	74.9	0.0	75.1	75.1	0.0
ST6	62.8	63.1	0.3	64.4	64.5	0.1
ST7	64.8	65.0	0.2	65.9	66.0	0.1
ST8	69.8	69.8	0.0	70.2	70.2	0.0
ST9	74.6	74.6	0.0	74.8	74.8	0.0
ST10	67.1	67.1	0.0	67.8	67.8	0.0

Project Composite Noise Calculations

Off-Site Receptor	Estimated Noise Levels								
	Ambient	Traffic	Mechanical	Parking	Trash Compactor and Loading	Outdoor	Project Composite	Ambient plus Project	Increase
	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL	CNEL
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
ST2	68.1	52.9	51.3	30.2	46.0	39.7	55.8	68.3	0.2
ST3	66.4	43.9	60.4	38.3	51.6	43.9	61.1	67.5	1.1
ST5	75.1	50.8	54.3	43.4	54.4	44.9	58.5	75.2	0.1
ST6	64.4	54.1	58.4	45.0	56.4	48.8	61.7	66.3	1.9
ST7	65.9	54.7	57.6	34.6	52.3	47.7	60.4	67.0	1.1
ST8	70.2	54.7	53.3	27.4	49.1	43.4	57.8	70.4	0.2
ST9	74.8	53.9	53.2	29.4	49.5	43.7	57.5	74.9	0.1
ST10	67.8	52.3	48.5	25.7	45.3	39.0	54.5	68.0	0.2

Roadway Traffic Noise Levels - Opening Year with Project Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction					
	Total	1057	56	none	Average (of DGAC and PCC)
	Automobiles	1036	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction					
	Total	1073	56	none	Average (of DGAC and PCC)
	Automobiles	1052	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction					
	Total	1035	56	none	Average (of DGAC and PCC)
	Automobiles	1014	56		
	Medium trucks	-	56		
	Heavy trucks	21	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction					
	Total	1254	56	none	Average (of DGAC and PCC)
	Automobiles	1254	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction					
	Total	971	56	none	Average (of DGAC and PCC)
	Automobiles	969	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction					
	Total	965	56	none	Average (of DGAC and PCC)
	Automobiles	946	56		
	Medium trucks	-	56		
	Heavy trucks	19	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction					
	Total	956	56	none	Average (of DGAC and PCC)
	Automobiles	937	56		
	Medium trucks	-	56		
	Heavy trucks	19	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction					
	Total	644	56	none	Average (of DGAC and PCC)
	Automobiles	644	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	51	56	none	Average (of DGAC and PCC)
	Automobiles	50	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	29	56	none	Average (of DGAC and PCC)
	Automobiles	28	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	109	56	none	Average (of DGAC and PCC)
	Automobiles	107	56		
	Medium trucks	-	56		
	Heavy trucks	-	56		
	Buses	2	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	144	56	none	Average (of DGAC and PCC)
	Automobiles	141	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction					
	Total	1084	56	none	Average (of DGAC and PCC)
	Automobiles	1062	56		
	Medium trucks	-	56		
	Heavy trucks	22	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction					
	Total	760	56	none	Average (of DGAC and PCC)
	Automobiles	745	56		
	Medium trucks	-	56		
	Heavy trucks	15	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Traffic Noise Levels - Opening Year with Project Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction					
	Total	525	56	none	Average (of DGAC and PCC)
	Automobiles	515	56		
	Medium trucks	-	56		
	Heavy trucks	11	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction					
	Total	84	56	none	Average (of DGAC and PCC)
	Automobiles	82	56		
	Medium trucks	-	56		
	Heavy trucks	2	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction					
	Total	538	56	none	Average (of DGAC and PCC)
	Automobiles	527	56		
	Medium trucks	-	56		
	Heavy trucks	11	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction					
	Total	259	56	none	Average (of DGAC and PCC)
	Automobiles	254	56		
	Medium trucks	-	56		
	Heavy trucks	5	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	724	56	none	Average (of DGAC and PCC)
	Automobiles	710	56		
	Medium trucks	-	56		
	Heavy trucks	14	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction					
	Total	1365	56	none	Average (of DGAC and PCC)
	Automobiles	1338	56		
	Medium trucks	-	56		
	Heavy trucks	27	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction					
	Total	1444	56	none	Average (of DGAC and PCC)
	Automobiles	1415	56		
	Medium trucks	-	56		
	Heavy trucks	29	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction					
	Total	1232	56	none	Average (of DGAC and PCC)
	Automobiles	1207	56		
	Medium trucks	-	56		
	Heavy trucks	25	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	1122	56	none	Average (of DGAC and PCC)
	Automobiles	1100	56		
	Medium trucks	-	56		
	Heavy trucks	22	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction					
	Total	785	56	none	Average (of DGAC and PCC)
	Automobiles	769	56		
	Medium trucks	-	56		
	Heavy trucks	16	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction					
	Total	147	56	none	Average (of DGAC and PCC)
	Automobiles	144	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction					
	Total	148	56	none	Average (of DGAC and PCC)
	Automobiles	145	56		
	Medium trucks	-	56		
	Heavy trucks	3	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction					
	Total	57	56	none	Average (of DGAC and PCC)
	Automobiles	56	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction					
	Total	34	56	none	Average (of DGAC and PCC)
	Automobiles	33	56		
	Medium trucks	-	56		
	Heavy trucks	1	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Traffic Noise Levels - Opening Year with Project Weekend

Station	Traffic values			Control	Road surface
	Vehicles type	Saturday	Speed		
		Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction					
	Total	844	56		
	Automobiles	827	56		
	Medium trucks	-	56		
	Heavy trucks	17	56		
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-		none	Average (of DGAC and PCC)
Ogden Dr-6th Street EB S Traffic direction: In entry direction					
	Total	275	56		
	Automobiles	270	56		
	Medium trucks	-	56		
	Heavy trucks	6	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			
Ogden Dr-6th Street NB E Traffic direction: In entry direction					
	Total	221	56		
	Automobiles	217	56		
	Medium trucks	-	56		
	Heavy trucks	4	56	none	Average (of DGAC and PCC)
	Buses	-	56		
	Motorcycles	-	56		
	Auxiliary vehicle	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	71.6	69.8	66.8	62.1	71.1
	Between Ogden Dr. and Curson Ave.	Residential	71.5	69.7	66.7	62.0	71.0
	East of Curson Ave.	Residential	69.4	67.6	64.6	59.9	68.9
Ogden Drive	North of 6th St.	Residential	62.8	61.0	58.0	53.3	62.3
	South of Wilshire Blvd.	Commercial	62.7	60.9	57.9	53.2	62.2
Spaulding Avenue	South of Wilshire Blvd.	Commercial	65.0	63.2	60.2	55.5	64.5
Curson Avenue	North of 6th St.	Residential	67.4	65.6	62.6	57.9	66.9
	Between 6th St. and Wilshire Blvd.	Residential	70.7	68.9	65.9	61.2	70.2
	South of Wilshire Blvd.	Residential	71.2	69.4	66.4	61.7	70.7
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	67.8	66.0	63.0	58.3	67.3
	Between Ogden Dr. and Spaulding Ave.	Commercial	67.0	65.2	62.2	57.5	66.5
	Between Spaulding. and Curson Ave.	Museum	68.9	67.1	64.1	59.4	68.4
	East of Curson Ave.	Commercial	67.9	66.1	63.1	58.4	67.4

Roadway Traffic Noise Levels - Opening Year with Project Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Wilshire Boulevard - Ogden Dr EB T Traffic direction: In entry direction							
	Total	955	1206	1927	56		
	Automobiles	936	1182	1888	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	24	39	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue EB T Traffic direction: In entry direction							
	Total	955	1216	1934	56		
	Automobiles	936	1192	1895	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	24	39	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T Traffic direction: In entry direction							
	Total	1031	1191	1940	56		
	Automobiles	1010	1167	1901	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	21	24	39	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue EB T2 Traffic direction: In entry direction							
	Total	1775	1463	2208	56		
	Automobiles	1775	1463	2208	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard - Ogden Dr WB T Traffic direction: In entry direction							
	Total	1403	1081	1102	56		
	Automobiles	1401	1079	1099	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	3	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Spaulding Avenue WB T Traffic direction: In entry direction							
	Total	1418	1076	1088	56		
	Automobiles	1390	1054	1066	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	28	22	22	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1369	1067	1071	56		
	Automobiles	1342	1046	1050	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	27	21	21	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 Traffic direction: In entry direction							
	Total	1202	755	795	56		
	Automobiles	1202	755	795	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	10	34	69	56		
	Automobiles	10	33	68	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	1	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Drive-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	20	19	56	56		
	Automobiles	20	19	55	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	0	0	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	127	72	86	56		
	Automobiles	124	71	84	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	3	1	2	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Spaulding Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	85	83	69	56		
	Automobiles	83	81	68	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	1	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB E Traffic direction: In entry direction							
	Total	934	1145	1397	56		
	Automobiles	915	1122	1369	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	19	23	28	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB W1 Traffic direction: In entry direction							
	Total	507	715	910	56		
	Automobiles	497	701	892	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	10	14	18	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Wilshire Boulevard-Curson Avenue WB T1 1 Traffic direction: In entry direction							
	Total	1003	613	654	56		
	Automobiles	983	601	641	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	20	12	13	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Traffic Noise Levels - Opening Year with Project Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Curson Avenue-Wilshire Boulevard NB W2 Traffic direction: In entry direction							
	Total	116	101	92	56		
	Automobiles	114	99	90	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	2	2	2	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard SB Traffic direction: In entry direction							
	Total	822	468	437	56		
	Automobiles	806	459	428	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	16	9	9	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard EB S Traffic direction: In entry direction							
	Total	359	176	272	56		
	Automobiles	352	172	267	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	7	4	5	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	1942	718	823	56		
	Automobiles	1903	704	807	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	39	14	16	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue WB T Traffic direction: In entry direction							
	Total	2184	1256	1053	56		
	Automobiles	2140	1231	1032	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	44	25	21	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr WB T Traffic direction: In entry direction							
	Total	2175	1320	1149	56		
	Automobiles	2132	1294	1126	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	44	26	23	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Ogden Dr EB T Traffic direction: In entry direction							
	Total	1012	1046	1924	56		
	Automobiles	992	1025	1886	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	20	21	38	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction							
	Total	1028	1001	1801	56		
	Automobiles	1007	981	1765	56		
	Medium trucks	-	-	-	56		
	Heavy trucks	21	20	36	56	none	Average (of DGAC and PCC)
	Buses	-	-	-	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
6th Street-Curson Avenue EB T Traffic direction: In entry direction		-	-	-			
	Total				56		
	Automobiles	728	883	1548	56		
	Medium trucks	713	865	1517	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	15	18	31	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street NB W Traffic direction: In entry direction		-	-	-			
	Total				56		
	Automobiles	183	143	235	56		
	Medium trucks	179	140	230	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	4	3	5	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-6th Street SB W Traffic direction: In entry direction		-	-	-			
	Total				56		
	Automobiles	297	135	189	56		
	Medium trucks	291	132	185	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	6	3	4	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street SB W Traffic direction: In entry direction		-	-	-			
	Total				56		
	Automobiles	100	26	41	56		
	Medium trucks	98	25	40	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	2	1	1	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street NB W Traffic direction: In entry direction		-	-	-			
	Total				56		
	Automobiles	29	21	171	56		
	Medium trucks	28	21	168	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	1	0	3	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Curson Avenue-Wilshire Boulevard NB Traffic direction: In entry direction		-	-	-			
	Total				56		
	Automobiles	650	688	994	56		
	Medium trucks	637	674	974	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	13	14	20	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
Ogden Dr-6th Street EB S Traffic direction: In entry direction		-	-	-			
	Total				56		
	Automobiles	69	140	72	56		
	Medium trucks	68	137	71	56		
	Heavy trucks	-	-	-	56	none	Average (of DGAC and PCC)
	Buses	1	3	1	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			

Roadway Traffic Noise Levels - Opening Year with Project Weekday

Station	Traffic values					Control	Road surface
	Vehicles type	AM	midday	PM	Speed		
		Veh/h	Veh/h	Veh/h	km/h		
Ogden Dr-6th Street NB E Traffic direction: In entry direction		-	-	-			
	Total				56	none	Average (of DGAC and PCC)
	Automobiles	10	154	175	56		
	Medium trucks	10	151	172	56		
	Heavy trucks	-	-	-	56		
	Buses	0	3	4	56		
	Motorcycles	-	-	-	56		
	Auxiliary vehicle	-	-	-			
		-	-	-			

Roadway Segment		Adjacent Land Use	Leq	Daytime	Evening	Nighttime	CNEL
			dBA	dBA	dBA	dBA	dBA
6th Street	Between Fairfax Ave. and Ogden Dr.	Residential	72.7	70.9	67.9	63.2	72.2
	Between Ogden Dr. and Curson Ave.	Residential	73.1	71.3	68.3	63.6	72.6
	East of Curson Ave.	Residential	72.1	70.3	67.3	62.6	71.6
Ogden Drive	North of 6th St.	Residential	64.2	62.4	59.4	54.7	63.7
	South of Wilshire Blvd.	Commercial	64.6	62.8	59.8	55.1	64.1
Spaulding Avenue	South of Wilshire Blvd.	Commercial	66.6	64.8	61.8	57.1	66.1
Curson Avenue	North of 6th St.	Residential	68.8	67.0	64.0	59.3	68.3
	Between 6th St. and Wilshire Blvd.	Residential	71.0	69.2	66.2	61.5	70.5
	South of Wilshire Blvd.	Residential	73.0	71.2	68.2	63.5	72.5
Wilshire Boulevard	Between Fairfax Ave. and Ogden Dr.	Museum	69.9	68.1	65.1	60.4	69.4
	Between Ogden Dr. and Spaulding Ave.	Commercial	68.9	67.1	64.1	59.4	68.4
	Between Spaulding. and Curson Ave.	Museum	71.0	69.2	66.2	61.5	70.5
	East of Curson Ave.	Commercial	69.8	68.0	65.0	60.3	69.3

APPENDIX D

Construction Vibration Calculations

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST2

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST2	Residential	168

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	168
Excavator	0.011	0.00275	68.79	168

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 168 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 168 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0051	0.2	62	80
Excavator	0.0051		62	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST3

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST3	Residential	300

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	300
Excavator	0.011	0.00275	68.79	300

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 300 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 300 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0021	0.2	54	80
Excavator	0.0021		54	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST5

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST5	Residential	245

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	245
Excavator	0.011	0.00275	68.79	245

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 245 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 245 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0029	0.2	57	80
Excavator	0.0029		57	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST6

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST6	Residential	137

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	137
Excavator	0.011	0.00275	68.79	137

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 137 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 137 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0069	0.5	65	80
Excavator	0.0069		65	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST7

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST7	Residential	135

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	135
Excavator	0.011	0.00275	68.79	135

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 135 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 135 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0070	0.5	65	80
Excavator	0.0070		65	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST8

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST8	Commercial	133

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	133
Excavator	0.011	0.00275	68.79	133

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 133 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 133 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0072	0.5	65	80
Excavator	0.0072		65	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST9

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST9	Commercial	116

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	116
Excavator	0.011	0.00275	68.79	116

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 116 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 116 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0088	0.3	67	80
Excavator	0.0088		67	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Engineered concrete and masonry (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Demolition - Construction
Vibration Impact Assessment
NSA: ST10

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST10	Commercial	418

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	418
Excavator	0.011	0.00275	68.79	418

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 418 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 418 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0013	0.5	50	80
Excavator	0.0013		50	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST2

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST2	Residential	168

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	168
Backhoe	0.011	0.00275	68.79	168

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 168 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 168 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0051	0.2	62	80
Backhoe	0.0051		62	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST3

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST3	Residential	95

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	95
Backhoe	0.011	0.00275	68.79	95

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 95 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 95 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0119	0.2	69	80
Backhoe	0.0119		69	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST5

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST5	Residential	146

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	146
Backhoe	0.011	0.00275	68.79	146

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 146 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 146 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0062	0.2	64	80
Backhoe	0.0062		64	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST6

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST6	Residential	102

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	102
Backhoe	0.011	0.00275	68.79	102

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 102 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 102 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0107	0.3	69	80
Backhoe	0.0107		69	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Engineered Concrete and Masonry. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST7

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST7	Residential	85

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	85
Backhoe	0.011	0.00275	68.79	85

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 85 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 85 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0140	0.3	71	80
Backhoe	0.0140		71	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Engineered Concrete and Masonry. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST8

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST8	Commercial	133

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	133
Backhoe	0.011	0.00275	68.79	133

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 133 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 133 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0072	0.3	65	80
Backhoe	0.0072		65	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Engineered Concrete and Masonry. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST9

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST9	Commercial	116

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	116
Backhoe	0.011	0.00275	68.79	116

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 116 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 116 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0088	0.3	67	80
Backhoe	0.0088		67	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Engineered concrete and masonry (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Site Preparation - Construction
Vibration Impact Assessment
NSA: ST10

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST10	Commercial	418

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Dozer	0.011	0.00275	68.79	418
Backhoe	0.011	0.00275	68.79	418

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 418 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 418 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Dozer	0.0013	0.3	50	80
Backhoe	0.0013		50	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Engineered Concrete and Masonry. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST2

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST2	Residential	168

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	168
Excavator	0.011	0.00275	68.79	168
Backhoe	0.011	0.00275	68.79	168
Dozer	0.011	0.00275	68.79	168
Scraper	0.000375	0.00009375	39.44	168

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 168 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 168 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0051	0.2	62	80
Excavator	0.0051		62	
Backhoe	0.0051		62	
Dozer	0.0051		62	
Scraper	0.0002		33	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST3

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST3	Residential	95

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	95
Excavator	0.011	0.00275	68.79	95
Backhoe	0.011	0.00275	68.79	95
Dozer	0.011	0.00275	68.79	95
Scraper	0.000375	0.00009375	39.44	95

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 95 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 95 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0119	0.2	69	80
Excavator	0.0119		69	
Backhoe	0.0119		69	
Dozer	0.0119		69	
Scraper	0.0004		40	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST5

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST5	Residential	146

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	146
Excavator	0.011	0.00275	68.79	146
Backhoe	0.011	0.00275	68.79	146
Dozer	0.011	0.00275	68.79	146
Scraper	0.000375	0.00009375	39.44	146

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 146 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 146 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0062	0.2	64	80
Excavator	0.0062		64	
Backhoe	0.0062		64	
Dozer	0.0062		64	
Scraper	0.0002		35	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST6

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST6	Residential	102

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	102
Excavator	0.011	0.00275	68.79	102
Backhoe	0.011	0.00275	68.79	102
Dozer	0.011	0.00275	68.79	102
Scraper	0.000375	0.00009375	39.44	102

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 102 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 102 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0107	0.2	69	80
Excavator	0.0107		69	
Backhoe	0.0107		69	
Dozer	0.0107		69	
Scraper	0.0004		39	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST7

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST7	Residential	85

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	85
Excavator	0.011	0.00275	68.79	85
Backhoe	0.011	0.00275	68.79	85
Dozer	0.011	0.00275	68.79	85
Scraper	0.000375	0.00009375	39.44	85

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 85 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 85 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0140	0.2	71	80
Excavator	0.0140		71	
Backhoe	0.0140		71	
Dozer	0.0140		71	
Scraper	0.0005		42	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST8

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST8	Commercial	133

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	133
Excavator	0.011	0.00275	68.79	133
Backhoe	0.011	0.00275	68.79	133
Dozer	0.011	0.00275	68.79	133
Scraper	0.000375	0.00009375	39.44	133

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 133 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 133 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0072	0.2	65	80
Excavator	0.0072		65	
Backhoe	0.0072		65	
Dozer	0.0072		65	
Scraper	0.0002		36	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST9

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST9	Commercial	116

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	116
Excavator	0.011	0.00275	68.79	116
Backhoe	0.011	0.00275	68.79	116
Dozer	0.011	0.00275	68.79	116
Scraper	0.000375	0.00009375	39.44	116

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 116 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 116 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0088	0.2	67	80
Excavator	0.0088		67	
Backhoe	0.0088		67	
Dozer	0.0088		67	
Scraper	0.0003		38	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Engineered concrete and masonry (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Grading - Construction
Vibration Impact Assessment
NSA: ST10

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST10	Commercial	418

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Grader	0.011	0.00275	68.79	418
Excavator	0.011	0.00275	68.79	418
Backhoe	0.011	0.00275	68.79	418
Dozer	0.011	0.00275	68.79	418
Scraper	0.000375	0.00009375	39.44	418

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 418 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 418 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Grader	0.0013	0.2	50	80
Excavator	0.0013		50	
Backhoe	0.0013		50	
Dozer	0.0013		50	
Scraper	0.0000		21	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST2

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST2	Residential	1094

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	1094
Vibratory Roller (large)	0.059	0.01475	83.38	1094

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 1094 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 1094 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0003	0.2	37	80
Vibratory Roller (large)	0.0016		52	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST3

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST3	Residential	622

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	622
Vibratory Roller (large)	0.059	0.01475	83.38	622

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 622 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 622 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0006	0.2	44	80
Vibratory Roller (large)	0.0038		60	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST5

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST5	Residential	338

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	338
Vibratory Roller (large)	0.059	0.01475	83.38	338

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 338 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 338 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0016	0.2	52	80
Vibratory Roller (large)	0.0095		68	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST6

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST6	Residential	346

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	346
Vibratory Roller (large)	0.059	0.01475	83.38	346

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 346 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 346 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0016	0.2	52	80
Vibratory Roller (large)	0.0092		67	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST7

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST7	Residential	571

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	571
Vibratory Roller (large)	0.059	0.01475	83.38	571

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 571 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 571 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0007	0.2	45	80
Vibratory Roller (large)	0.0043		61	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST8

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST8	Commercial	836

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	836
Vibratory Roller (large)	0.059	0.01475	83.38	836

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 836 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 836 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0004	0.2	40	80
Vibratory Roller (large)	0.0024		56	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST9

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST9	Commercial	824

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	824
Vibratory Roller (large)	0.059	0.01475	83.38	824

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 824 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 824 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0004	0.2	40	80
Vibratory Roller (large)	0.0025		56	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Engineered concrete and masonry (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST10

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST10	Commercial	1264

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Paver	0.01	0.0025	67.96	1264
Vibratory Roller (large)	0.059	0.01475	83.38	1264

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 1264 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 1264 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Paver	0.0002	0.2	35	80
Vibratory Roller (large)	0.0013		50	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST2

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST2	Residential	540

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	540
Backhoe	0.011	0.00275	68.79	540

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 540 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 540 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0001	0.2	26	80
Backhoe	0.0009		47	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST3

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST3	Residential	271

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	271
Backhoe	0.011	0.00275	68.79	271

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 271 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 271 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0002	0.2	35	80
Backhoe	0.0025		56	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST5

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST5	Residential	422

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	422
Backhoe	0.011	0.00275	68.79	422

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 422 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 422 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0001	0.2	29	80
Backhoe	0.0013		50	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Non-engineered timber and masonry buildings . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST6

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST6	Residential	265

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	265
Backhoe	0.011	0.00275	68.79	265

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 265 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 265 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0002	0.2	35	80
Backhoe	0.0025		56	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST7

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST7	Residential	405

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	405
Backhoe	0.011	0.00275	68.79	405

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 405 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 405 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0001	0.2	30	80
Backhoe	0.0013		51	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST8

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST8	Commercial	668

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	668
Backhoe	0.011	0.00275	68.79	668

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 668 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 668 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0001	0.2	23	80
Backhoe	0.0006		44	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST9

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST9	Commercial	671

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	671
Backhoe	0.011	0.00275	68.79	671

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 671 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 671 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0001	0.2	23	80
Backhoe	0.0006		44	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Engineered concrete and masonry (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

La Brea Tar Pits Master Plan
Building Construction - Construction
Vibration Impact Assessment
NSA: ST10

Receiver

Description	Land Use	Equipment Receptor Distance
		(feet)
ST10	Commercial	660

Construction Equipment - Model Inputs

Description	Reference PPV @ 100 ft.	Reference Vibration Amplitude, Lv,rms *	Reference Vibration Velocity Level, Lv	Equipment Receptor Distance
	(in/sec) [1]	(mm/s) [2]	(VdB)	(feet)
Crane	0.001	0.00025	47.96	660
Backhoe	0.011	0.00275	68.79	660

[1] Reference PPV taken from the final Construction Noise and Vibration Report SR 520, West Connection Bridge Project, Washington State Department of Transportation, and based on measurements from several projects including the Central Artery/Tunnel Project in Boston and from several published sources including the FTA Manual and Dowding's Textbook.

[2] Assumes a crest factor of 4.

Construction Equipment - Model Results

Description	Projected Peak Particle Velocity @ 660 feet	Vibration Impact Criteria: Architectural Damage [2]	Projected Vibration Velocity Level @ 660 feet, Lv	Vibration Impact Criteria: Human annoyance from building vibration
	(in/sec) [1]	(in/sec)	(VdB) [1]	(VdB) [3]
Crane	0.0001	0.2	23	80
Backhoe	0.0006		44	

[1] Bolded values indicate potential exceedance over Criteria

[2] FTA Construction Vibration Damage Criteria for Reinforced-concrete, steel or timber (no plaster) . Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 12, Table 12-3.

[3] Ground-Borne Vibration Impact Criteria for residences and buildings where people normally sleep for infrequent vibration events. Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006, Chapter 8, Table 8-1.

Vibration Impact Assessment
Construction

Equipment Vibration Emission Levels

Equipment Description	Vibration Type Steady or transient	Ref PPV at 100 ft.
3-ton truck at 35 mph	Steady	0.0002
Auger Drill Rig	Steady	0.011125
Backhoe	Steady	0.011
Bar Bender	Steady	N/A
Blasting	Transient	0.75
Boring Jack Power Unit	Steady	N/A
Chain Saw	Steady	N/A
Clam Shovel	Transient	0.02525
Compactor	Steady	0.03
Compressor	Steady	N/A
Concrete Batch Plant	Steady	N/A
Concrete Mixer	Steady	0.01
Concrete Pump	Steady	0.01
Concrete Saw	Steady	N/A
Crane	Steady	0.001
Dozer	Steady	0.011
Dump Truck	Steady	0.01
Excavator	Steady	0.011
Flat Bed Truck	Steady	0.01
Front End Loader	Steady	0.011
Generator	Steady	N/A
Gradall	Steady	0.011
Grader	Steady	0.011
Horizontal Boring Hydraulic Jack	Steady	0.003
Hydra Break Ram	Transient	0.05
Impact Pile Driver	Transient	0.2
Insitu Soil Sampling Rig	Steady	0.011125
Jackhammer	Steady	0.003
Mounted Hammer hoe ram	Transient	0.18975
Paver	Steady	0.01
Pickup Truck	Steady	0.01
Pneumatic Tools	Steady	N/A
Pumps	Steady	N/A
Rock Drill	Steady	0.011125
Scraper	Steady	0.000375
Slurry Trenching Machine	Steady	0.002125
Soil Mix Drill Rig	Steady	0.011125
Tractor	Steady	0.01
Tunnel Boring Machine (rock)	Steady	0.0058
Tunnel Boring Machine (soil)	Steady	0.003
Vibratory Pile Driver	Steady	0.14
Vibratory Roller (large)	Steady	0.059
Vibratory Roller (small)	Steady	0.022
Welder	Steady	N/A

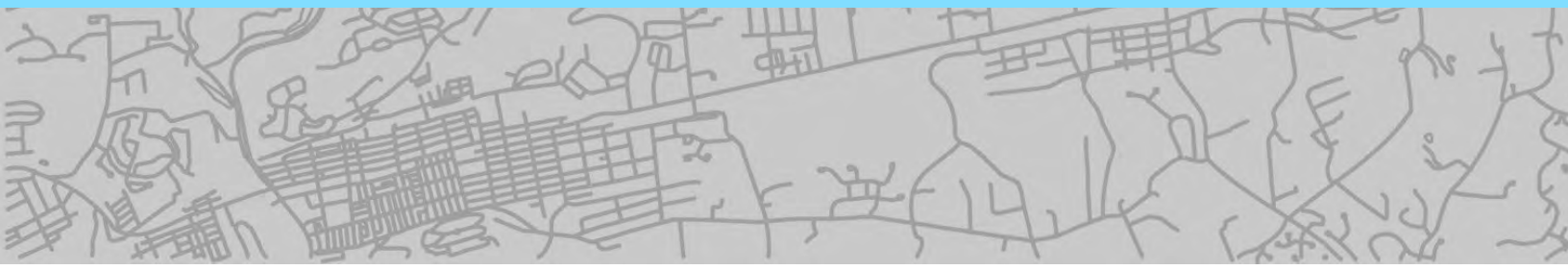
APPENDIX J

Final Transportation Assessment

KITTELSON & ASSOCIATES

LA BREA TAR PITS MASTER PLAN
FINAL
TRANSPORTATION ASSESSMENT
LOS ANGELES, CA

August 8, 2022



Inside front cover

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La Brea Tar Pits Master Plan
Final Transportation Assessment

Los Angeles, CA

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August 8, 2022

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Section 1 — Executive Summary

EXECUTIVE SUMMARY

This report presents the results of the California Environmental Quality Act (CEQA) transportation impact analysis and non-CEQA transportation analysis conducted by Kittelson & Associates for the proposed La Brea Tar Pits Master Plan Project (proposed project) located in Los Angeles, California. The analysis has been conducted in accordance with the City's Transportation Assessment Guidelines (TAG) and is based on the approved Memorandum of Understanding (MOU), which is included in the appendix.

The proposed project is located at 5801 Wilshire Boulevard, in the Miracle Mile neighborhood in the City of Los Angeles. The 13-acre project site occupies the eastern and northeastern portions of the 23-acre Hancock Park. The project site broadly encompasses what is known as the La Brea Tar Pits, which includes the George C. Page Museum (Page Museum); the physical tar pit features located within the Hancock Park grounds, some of which are research sites; the concession and public restroom building; a multipurpose lawn, recreation areas, and landscaped features throughout the park; and a surface parking lot.

The proposed project develops a La Brea Tar Pits Master Plan that would renovate the existing Page Museum and add a new two-story Museum building toward the northwest, increasing the total Museum square footage. The two-story new Museum building would be located to the northwest of the Page Museum. The new building would be approximately 40,000 gross square feet, which would increase the total Museum square footage to 105,000 gross square feet. The new museum building would include an extended central lobby, exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock. The project is expected to be completed in approximately 7 to 10 years, with phased improvements and construction occurring as funding becomes available.

The renovation includes improving the existing central atrium to allow for additional exhibition, classroom, and laboratory spaces. A café could be added to the outdoor terrace on the western side of the Museum.

The County of Los Angeles (County) is the lead agency. The La Brea Tar Pits and Page Museum are owned by the County but are managed by the non-profit Los Angeles County Museum of Natural History Foundation which includes operations of the Natural History Museums of Los Angeles County (NHMLAC), including the La Brea Tar Pits and Page Museum.

SUMMARY OF CEQA FINDINGS

The results of the transportation impact analysis are summarized below.

THRESHOLD T-1 (CONFLICTING WITH PLANS, PROGRAMS, ORDINANCES, OR POLICIES)

The project may conflict with the Los Angeles Municipal Code (LAMC) requirements for bicycle parking and transportation demand management (TDM). In addition, it was determined that the project would be inconsistent with regional plans related to mobility and greenhouse gas (GHG) reductions. The proposed project would result in a **significant impact** related to consistency with plans, programs, ordinances, or policies. The proposed project would also contribute to a **significant cumulative impact** related to consistency with plans, programs, ordinances, or policies.

Therefore, **Mitigation Measure #1** is proposed, detailed below.

Mitigation Measure #1 Transportation Demand Management (TDM) Program

To reduce Museum employee and visitor vehicle trips and increase alternative modes such as walking, bicycling, public transit, and rideshare, the proposed project shall prepare and implement a TDM program. The program shall be developed in consultation with Los Angeles Department of Transportation (LADOT).

The proposed project will designate an existing member of staff as the on-site TDM Coordinator. This coordinator shall be responsible for monitoring and tracking employee and visitor mode share and annual reporting to LADOT.

Employee Strategies

Information shall be distributed to employees and displayed on a bulletin board, display case, or kiosk (displaying transportation information) where the greatest number of employees are likely to see it. The following measures may be applied to reduce employee vehicle trips and vehicle miles traveled (VMT):

- Provide a transportation information bulletin board on-site with public transit information, contact information for rideshare and transit, ridesharing promotional material, bike route and facility information, and listing of on-site services or facilities.
- Provide facilities on-site to support bicycling to work, such as secure bike parking, showers, and lockers.
- Encourage and support participation in LA Metro vanpool, including subsidies for participation.
- Implement paid parking for employees.
- Subsidize transit passes.
- Offer flexible work schedules and telecommuting, when feasible.

Visitor Strategies

Transportation information for visitors should be displayed on the Museum's website and distributed with physical marketing materials. The following measures may be applied to reduce visitor vehicle trips and VMT:

- Advertise and offer discounted Museum tickets for visitors who use public transit or a bicycle to visit the project.
- Provide and maintain secure on-site bicycle parking for visitors, and monitor usage to determine if additional bicycle racks are needed.
    - Provide wayfinding signage directing bicyclists from the visitor entrances to where on-site bicycle parking is located.
    - Ensure bicycle parking is well lit and monitored by staff.
- Continue to have paid parking for visitors.
- Coordinate with LA Metro to improve transit access and user comfort and encourage visitors to take local bus service or the future Purple Line extension to the Museum, through the following measures:
    - Improve pedestrian wayfinding between the planned Purple Line station, local bus stops, and the Museum.
    - Implement bus stop improvements such as shelters along Wilshire Boulevard bus stops that would be used by Museum visitors.
    - Coordinate with LA Metro and the City of Los Angeles to ensure that safe and comfortable pedestrian facilities (such as ADA curb ramps and continental crosswalks) are available between local bus stops and the project entrances, including at the Curson Avenue/ Wilshire Boulevard intersection.
- Coordinate with the City of Los Angeles to implement planned bikeways in the vicinity of the project site, and contribute to the implementation of the bikeways. This includes planned bikeways along Wilshire Boulevard and 6th Street.

Implementation of Mitigation Measure #1 would encourage employees and visitors to reduce their vehicle trips, and contribute to VMT and GHG reduction goals. This measure also supports multimodal connectivity

in the study area. With the implementation of Mitigation Measure #1, the impact related to consistency with plans, programs, ordinances, or policies would be reduced to **less than significant with mitigation**. In addition, the cumulative impact related to consistency with plans, programs, ordinances, or policies would be reduced to **less than significant with mitigation**.

THRESHOLD T-2 (CAUSING SUBSTANTIAL VEHICLE MILES TRAVELED),

Given that the project would result in a net increase in VMT, the proposed project would result in a **significant impact** related to causing substantial vehicle miles traveled, and would contribute to a **significant cumulative impact** related to causing substantial vehicle miles traveled.

Mitigation Measure #1, which requires the project to implement a TDM program and coordinate on multimodal improvements in the study area, can help reduce employee and visitor VMT and support multimodal connectivity.

Given the magnitude of VMT that would need to be reduced due to visitor trips being 196% longer than average regional recreation trips, Mitigation Measure #1 would be insufficient to reduce VMT to less-than-significant levels. Therefore, even with the implementation of Mitigation Measure #1, the impact related to causing substantial vehicle miles traveled would remain **significant and unavoidable** after mitigation. In addition, the cumulative impact related to causing substantial vehicle miles traveled would remain **significant and unavoidable** after mitigation.

THRESHOLD T-3 (SUBSTANTIALLY INCREASING HAZARDS DUE TO A GEOMETRIC DESIGN FEATURE OR INCOMPATIBLE USE

Based on the proposed site plan and evaluation of geometric design and uses, the proposed project would result in a **less than significant impact** when considering increasing hazards. The proposed project would also result in a **less than significant cumulative impact** when considering increasing hazards based on the geometric design and uses of the proposed project.

No mitigation measures are needed to address potential hazards for the proposed project.

SUMMARY OF NON-CEQA ASSESSMENT RECOMMENDATIONS

The results of the non-CEQA transportation analysis are summarized below.

PEDESTRIAN, BICYCLE, AND TRANSIT ACCESS ASSESSMENT

In order to improve pedestrian and transit access in the study area, the project should coordinate with the City of Los Angeles to explore the feasibility of implementing the following improvements:

- Continental crosswalks at the Curson Avenue/Wilshire Boulevard intersection and frontage road crossing directly to the east of the intersection;
- High-visibility curb ramps with truncated domes at the Spaulding Avenue/Wilshire Boulevard intersection, Curson Avenue/Wilshire Boulevard intersection, and frontage road crossing directly to the east of the Curson Avenue/Wilshire Boulevard intersection; and
- Pedestrian recall timing (as opposed to pedestrian push buttons) for the north-south crosswalks at the Curson Avenue/Wilshire Boulevard and Spaulding Avenue/Wilshire Boulevard intersections.

In order to improve transit access in the study area, the project should coordinate with the City of Los Angeles and LA Metro to install shelters at the two Spaulding Avenue/Wilshire Boulevard stops and one Curson Avenue/Wilshire Boulevard stop that currently lack them.

PROJECT ACCESS SAFETY AND CIRCULATION EVALUATION

Several potential deficiencies may arise at the project driveways and in the study area.

- The project is expected to contribute to increased delay at the Curson Avenue/Wilshire Boulevard intersection, which operates at LOS F during the weekday midday, weekday PM, and Saturday midday peak hours. The Curson Avenue/Wilshire Boulevard intersection is utilized by multiple bus routes that run along Wilshire Boulevard.
- The northbound exiting approach from the 6th Street driveway is expected to experience LOS E conditions during the weekday AM and PM peak hours.
- At the Curson Avenue/Wilshire Boulevard intersection, the southbound queues may interfere with the crosswalks at the Curson Avenue/6th Street intersection and the northbound queues may conflict with the crosswalks at the Curson Avenue/8th Street intersection.
- The length of the eastbound and northbound queues at the Curson Avenue/6th Street intersection and southbound queues at the Curson Avenue/Wilshire Boulevard are expected to interfere with accessing the project driveways and may interfere with driveway operations
- Curbside passenger loading along 6th Street could result in conflicts with bicyclists once planned separated bike lanes are implemented.

In order to improve access safety and circulation, the project should coordinate with the City of Los Angeles to explore the feasibility of implementing the following improvements:

- The Curson Avenue/Wilshire Boulevard intersection is built out. Signal timing should be regularly updated to optimize splits. In addition, the weekday AM and PM peak period bus-only lanes on Wilshire could potentially be extended to the weekday midday and weekend midday peak hours to improve bus operations through that intersection.
- The Curson Avenue/6th Street intersection is built out. Signal timing should be regularly updated to optimize splits. In addition, striping could be improved to extend the northbound left turn lane at the intersection, and/or add an inbound left-turn lane at the project's Curson Avenue driveway.
- Incorporate safety features to accommodate passenger pick-up and drop-off along 6th Street when planned separated bike lanes are implemented.

In addition, driveway operations at Curson Avenue should be monitored.

Mitigation Measure #1, which requires the project to implement a TDM program and coordinate on multimodal improvements in the study area, can help reduce employee and visitor vehicle trips and related effects on project access safety and circulation.

PROJECT CONSTRUCTION

The proposed project's likely impact during construction requires corrective measures. A construction traffic management plan will be required and coordinated with LADOT prior to starting construction on components of the Master Plan that require construction to impact the public right-of-way.

The construction traffic management plan should identify the duration and level of construction activity and consider the following features:

- Develop a detour plan for vehicles, pedestrians, and bicyclists as necessary.
- Consider modification of construction procedures to minimize duration or level of impact.
- Limit major road obstructions to off-peak hours.
- Coordinate with emergency service and public transit providers.
- Provide alternative vehicular, bicycle, and/or pedestrian access to affected parcels.
- Consult with LADOT if temporary closure of a travel lane may be necessary to maintain adequate pedestrian and bicycle access as part of the traffic management plan.
- Consult LADOT's Parking Meters Division regarding revenue recovery costs for the removal of parking meter spaces, if applicable.

- Coordinate access with adjacent property owners and tenants.
- Coordinate with Metro regarding maintenance of ADA access to Metro stations, stops, and transit facilities (e.g., layover zones) during revenue hours.
- Coordinate with transit providers regarding the need to temporarily close or relocate bus stops or reroute service.

RESIDENTIAL STREET CUT-THROUGH ANALYSIS

The proposed project's expected contribution to traffic on residential streets is anticipated to be below the City's thresholds. Therefore, no corrective measures have been recommended.

SPECIAL EVENTS

The proposed project should have corrective measures to address the potential of special events. A special event traffic management plan should be created in coordination with LADOT and confirmed prior to special events hosted at the site.

The special event traffic management plan may consider the following features:

- Vehicle parking supply
- Loading/unloading areas and management
- Traffic control at adjacent intersections and roadways
- Pedestrian circulation and facilities
- Bike parking supply
- Shuttle services

Section 2 — Project Description

PROJECT DESCRIPTION

The proposed project is located at 5801 Wilshire Boulevard, in the Miracle Mile neighborhood in the City of Los Angeles. The 13-acre project site occupies the eastern and northeastern portions of the 23-acre Hancock Park. The project site broadly encompasses what is known as the La Brea Tar Pits, which includes the George C. Page Museum (Page Museum); the physical tar pit features located within the Hancock Park grounds, some of which are research sites; the concession and public restroom building; a multipurpose lawn, recreation areas, and landscaped features throughout the park; and a surface parking lot. The site is bounded by Wilshire Boulevard to the south, West Sixth Street to the north, South Curson Avenue to the east, and Los Angeles County Museum of Art (LACMA) to the west. Also located to the west and just beyond LACMA's facilities are the Academy Museum of Motion Pictures and South Fairfax Avenue.

The proposed project develops a La Brea Tar Pits Master Plan that would renovate the existing Page Museum and add a new two-story Museum building toward the northwest, increasing the total Museum square footage. The two-story new Museum building would be located to the northwest of the Page Museum. The new building would be approximately 40,000 gross square feet, which would increase the total Museum square footage to 105,000 gross square feet. The new Museum building would include an extended central lobby, exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock. The project is expected to be completed in approximately 7 to 10 years, with phased improvements and construction occurring as funding becomes available. The conceptual site plan is shown in Figure 1. The project site and study area are shown in Figure 2.

The County of Los Angeles (County) is the lead agency. The La Brea Tar Pits and Page Museum are owned by the County but are managed by the non-profit Los Angeles County Museum of Natural History Foundation which includes operations of the Natural History Museums of Los Angeles County (NHMLAC), including the La Brea Tar Pits and Page Museum. LACMA facilities adjacent to the project site and also partially within Hancock Park; however, LACMA's facilities are not included in the proposed project.

The project is located at assessor's parcel number (APN) 5508-016-902, in City Council District 5.

EXISTING AND PROPOSED USES

The project site currently consists of the 63,000 square foot Page Museum and the La Brea Tar Pits. The proposed project includes renovating the existing Museum and adding a new two-story Museum building. This would increase the total Museum square footage from 63,000 gross square feet to 105,000 gross square feet, a net increase of 42,000 gross square feet or approximately 67%.

The renovation includes improving the existing central atrium to allow for addition exhibition, classroom, and laboratory spaces. A café could be added to the outdoor terrace on the western side of the Museum.

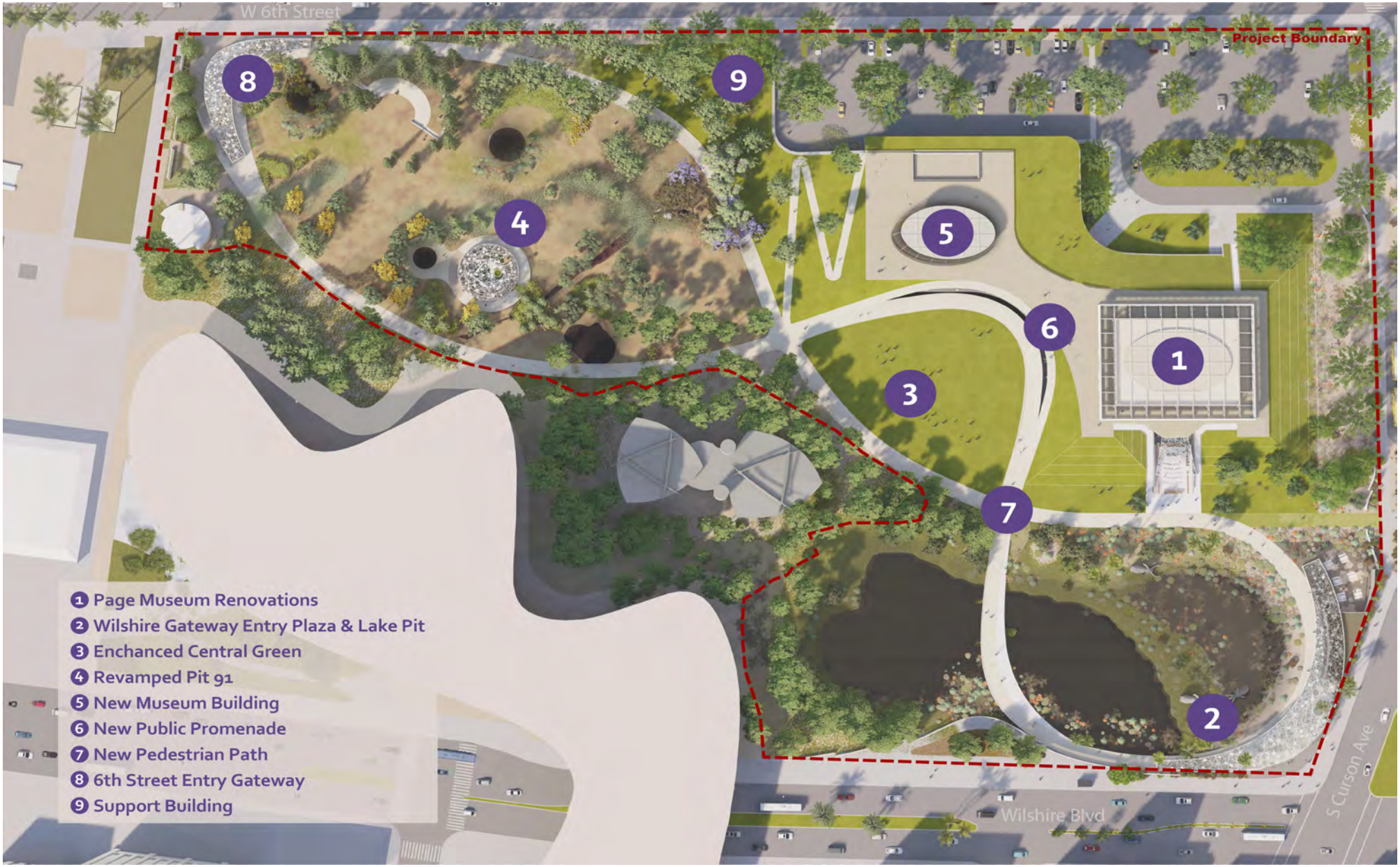
PROPOSED CIRCULATION AND PARKING

The current site includes a 154-space parking lot with a driveway on Curson Avenue. The project proposes to shift the parking lot to the northeast and reconfigure it to incorporate a drop-off area but not have an increase in the on-site parking supply. An additional access driveway to the parking lot from 6th Street is planned on the northwest side of the parking lot and the existing driveway from Curson Avenue would remain.

On-site circulation would be facilitated by the following improvements:

- Pedestrian entrance to the Museum leading from the parking lot.
- Pedestrian path through Hancock Park.

- Wilshire Gateway entry plaza at the southeastern corner of the site.
- 6th Street Gateway entry plaza at the northwestern corner of the site.
- Pedestrian bridge over the Lake Pit.



LA BREA TAR PITS MASTER PLAN

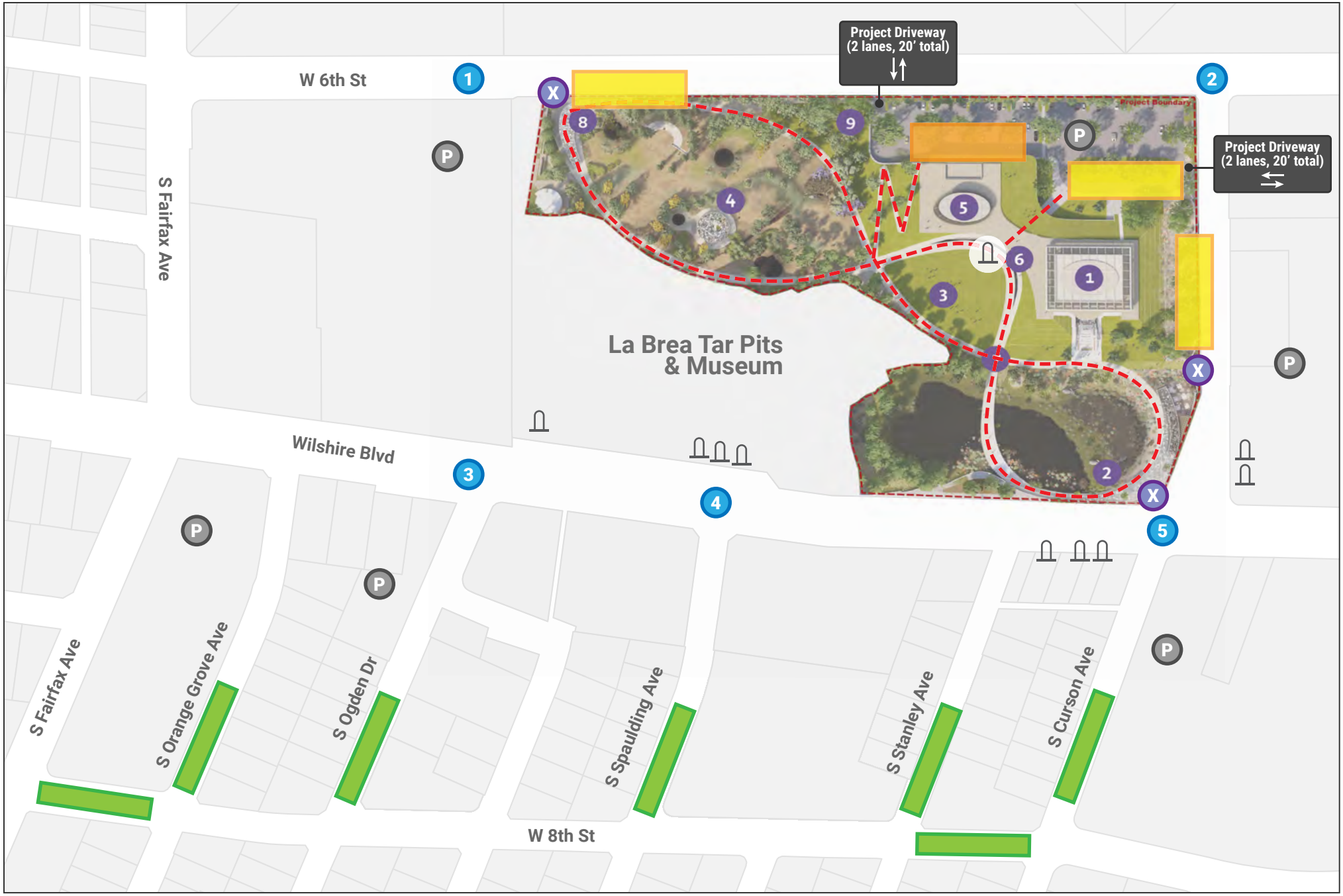
Conceptual Site Plan
Figure 1

Los Angeles County, CA
34.0637°N 118.3576°W

N

Base Map: Weiss/Manfredi, 2021
accessed February 2022
Updated: 2/2/2022
Project No. 63953
Layout: 63953_LaBrea_SitePlan
Aprx: 63953_La_Brea

SWCA
ENVIRONMENTAL CONSULTANTS



Study Intersection
Parking
Pedestrian Entrances
Bike Rack
Study Segment
Passenger Loading Zones
Delivery Loading Zone
Pedestrian Walking Routes

Scale in Feet
0 300
North

Project Site and Study Area

Page Museum | Master Plan EIR

Figure 2

PROPOSED TRANSPORTATION DEMAND MANAGEMENT MEASURES

The following Transportation Demand Management (TDM) measure is included as part of the proposed project:

- Subsidized transit passes for employees

PROJECT TRIP GENERATION

The proposed project's multimodal trip generation estimates are outlined below. The information in this section was prepared for City approval in the Transportation Assessment Memorandum of Understanding (MOU) dated May 2, 2022.

Trip generation for the proposed expansion was prepared by first establishing an existing trip generation rate for the weekday daily, weekday AM peak hour, weekday midday peak hour, weekday PM peak hour, Saturday daily, and Saturday midday peak hour periods using historical data specific to the site and the existing Museum square footage and number of employees. Then, the trip generation rates were applied to the proposed increase in Museum square footage to estimate the net increase in project-generated trips. Trip generation was estimated separately for employees and for visitors.

EMPLOYEE TRIPS

The following employee trip generation rates were developed using mode share information from 2019 Los Angeles County Natural History Museum employee travel surveys. The Museum is typically open from 9:30 AM to 5:00 PM on weekdays and weekends, but closed on Tuesdays. The trip generation rates were developed with the assumption that 100% of all employees arrive at the site during the AM peak hour (in advance of the 9:30 AM opening) and 100% of all employees exit the site during the PM peak hour (shortly after the 5:00 PM closing). Note, since weekend surveys were not available, the same trip generation rates and patterns would be used to estimate Saturday daily and midday peak hour employee trip generation.

- **Daily**: 1.40 vehicle trips per employee
- **AM peak hour**: 0.70 vehicle trips per employee
- **Midday peak hour**: 0.00 vehicle trips per employee
- **PM peak hour**: 0.70 vehicle trips per employee

Currently, the Museum staff consists of 25 employees. The proposed expansion would increase the Museum square footage by approximately 67%. To estimate the net increase in employee trip generation, it was assumed that the number of employees would also increase by 67%, or 17 additional employees. As shown in Table 1, this results in a net employee trip generation of 24 weekday daily trips, 12 weekday AM peak hour inbound trips, 12 weekday PM peak hour outbound trips, and 24 Saturday daily trips.

Table 1: Employee Trip Generation Estimate (Net Increase)

Trip Generation Rates							
Rate	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Per employee	1.40	100%	0%	0.70	0%	100%	0.70
Trip Generation Estimates							
Size	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
17 employees	24	12	0	12	0	12	12

SOURCE: KITTELSON & ASSOCIATES, 2022.

VISITOR TRIPS

Visitor trip generation was developed through the following steps:

1. Estimate person trip generation for the existing Museum
2. Apply mode share adjustments to obtain existing vehicle trip generation
3. Develop existing site trip generation rates
4. Apply existing trip generation rates to the increase in Museum square footage to obtain net vehicle trip generation and bicycle, pedestrian, and transit trip generation

The project applicant provided monthly and daily attendance data for January 2017 through December 2021, which have been attached to this study. Within that timeframe, July 2017 experienced the highest number of visitors (58,248). Therefore, person trip generation was estimated using weekday and Saturday data from that month. The busiest weekdays and Saturdays from that month are listed below.

- Weekdays
  - 7/3 – 2,815 visitors
  - 7/26 – 2,026 visitors
  - 7/28 – 1,998 visitors
- Saturdays
  - 7/15 – 2,473 visitors
  - 7/22 – 2,642 visitors
  - 7/29 – 2,607 visitors

July 26, 2017, was selected for estimating weekday trip generation (July 3rd was part of the long July 4th weekend and would not be representative of typical weekday activity levels). July 22, 2017, was selected for estimating Saturday trip generation.

The ticket counter information provided by the applicant included the time of entry. According to the applicant, the average length of a visit is between approximately 60 and 90 minutes; therefore, 75 minutes was used. With this information, the arrival and departure of visitors throughout the day was able to be estimated.

Existing weekday and Saturday person trip generation were estimated based on the daily total visitors for both days. Weekday midday peak hour, weekday PM peak hour, and Saturday midday peak hour person trip generation and inbound/outbound percentages were developed by examining the highest-volume hours during those peak periods. Weekday AM peak hour trip generation was not estimated since the Museum is closed at that time and did not have any visitors. Existing person-trips and person-trip generation rates for the Museum are detailed in a matrix attached to this study.

The resulting existing person-trip estimates are listed below:

- **Weekday daily**: 4,052 person-trips
- **Weekday midday peak hour**: 977 person-trips
- **Weekday PM peak hour**: 232 person-trips
- **Saturday daily**: 5,284 person-trips
- **Saturday midday peak hour**: 907 person-trips

Data from the California Household Travel Survey (CHTS)[1] was utilized to estimate the mode share and trips by mode for existing site visitors, to then prepare vehicle trip generation rates and other modal trip generation rates for the site. According to the CHTS, mode share for recreational trips for zip codes in the city is as follows:

- **Vehicle Driver**: 42%
- **Vehicle Passenger**: 27%

[1] https://www.nrel.gov/transportation/secure-transportation-data/tsdc-california-travel-survey.html

- **Transit**: 2%
- **Bike**: 1%
- **Walk**: 28%

The CHTS's 28% walking mode share was determined to be too high for this project, given its role as a regional (as opposed to local-serving) recreational attraction. Therefore, the walking mode share assumption was capped at 10%, with the remainder distributed among vehicle driver, vehicle passenger, and transit as shown below:

- **Vehicle Driver**: 47%
- **Vehicle Passenger**: 30%
- **Transit**: 12%
- **Bike**: 1%
- **Walk**: 10%

This mode share assumption also acknowledges the density of existing and future transit service in the area, especially including the Purple Line extension currently under construction.

The detailed existing site trips by mode and modal trip generation rates are provided in the matrix attached to this study. The modal trip generation rates were applied to the net increase in Museum square footage (42,000 square feet) to estimate the net increase in visitor vehicle trips and other modes. Table 2 through Table 5 display the visitor trip generation rates and net trip generation estimates for each mode for the Museum expansion.

Table 2: Visitor Vehicle Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	30.22	35%	65%	7.29	22%	78%	1.73	39.41	51%	49%	6.76
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	1,269	107	199	306	16	57	73	1,655	145	139	284

SOURCE: KITTELSON & ASSOCIATES, 2022.

Table 3: Visitor Transit Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	7.71	35%	65%	1.86	22%	78%	0.44	10.06	51%	49%	1.73
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	324	27	51	78	4	14	18	423	37	36	73

SOURCE: KITTELSON & ASSOCIATES, 2022.

Table 4: Visitor Bike Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	0.65	35%	65%	0.16	22%	78%	0.03	0.84	51%	49%	0.14
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	27	2	5	7	0	1	1	35	3	3	6

SOURCE: KITTELSON & ASSOCIATES, 2022.

Table 5: Visitor Walking Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	6.43	35%	65%	1.56	22%	78%	0.37	8.38	51%	49%	1.44
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	270	23	43	66	4	12	16	352	31	29	60

SOURCE: KITTELSON & ASSOCIATES, 2022.

NET VEHICLE TRIP GENERATION ESTIMATE

The estimated net increase in vehicle trips generated by the Museum expansion is detailed in Table 6, combining the net increases for both employee and visitor vehicle trips.

Table 6: Net Vehicle Trip Generation Estimate

Weekday									
Daily	AM Peak Hour			Midday Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
1,293	12	0	12	107	199	306	16	69	85
Saturday									
Daily	AM Peak Hour			Midday Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
1,679	*(not analyzed)*			145	139	284	*(not analyzed)*		

SOURCE: KITTELSON & ASSOCIATES, 2022.

Note, the Page Museum is one of a number of museums in the study area. It is expected that a portion of visitors to the study area will visit multiple museums in a single visit. This includes the additional visitors to the area due to the Museum expansion; a portion of the increase in visitors could come from other nearby museums such as LACMA. Therefore, the trip generation detailed in this section and used elsewhere in this report (such as for the traffic operations assessment) is conservative by linearly estimating the net increase in trips associated with the Museum expansion.

Section 3 — Project Context

PROJECT CONTEXT

This chapter details the area surrounding the project site, including existing transportation infrastructure and conditions in the study area.

ROADWAY NETWORK

The roadway system in the study area consists of avenue, collector, and local streets that serve local and regional traffic demand. The roadways in the study area are discussed below. Classifications are illustrated in Figure 3; modal priorities are illustrated in Figure 4.

AVENUE I/II STREETS

In the City's Mobility Plan 2035 (June 2016), Avenue I and Avenue II streets are major thoroughfares that are designed to have 100 feet of right-of-way and 70 feet of roadway width for Avenue I streets and 86 feet of right-of-way and 56 feet of roadway width for Avenue II streets.

Wilshire Boulevard is an Avenue I street on the southern border of the site. The road has a four-lane cross section with a center median that has eastbound left-turn lanes at intersection approaches. Both eastbound and westbound directions have a joint parking lane/bus lane along the curb that allow for vehicle parking except during weekday AM and PM peak periods, where buses and right-turning vehicles have exclusive access to these lanes. The curb-to-curb roadway width is approximately 76 feet and the posted speed limit is 35 miles per hour (MPH). According to the City's Mobility Plan 2035, within the study area Wilshire Boulevard has multiple modal priorities; it is on the Transit Enhanced Network (Comprehensive Transit Enhanced Street), Bicycle Lane Network (Tier 2 Bicycle Lane), and Pedestrian Analysis Network. Wilshire Boulevard (east of Fairfax Avenue) is on the City's Vision Zero High-Injury Network.

Fairfax Avenue is an Avenue II street on the western border of the block that includes the La Brea Tar Pits Museum site as well as LACMA and the Academy Museum of Motion Pictures. The road has a four-lane cross section with a center median that allows for left-turning vehicles at intersections. There are also designated right turn lanes on the northbound approach to W 6th Street and the southbound approach to Wilshire Boulevard. There is limited street parking on the west side of the street. The curb-to-curb roadway width is approximately 60-68 feet (depending on the presence of parking and right-turn lanes), and the posted speed limit is 35 MPH. According to the City's Mobility Plan 2035, within the study area Fairfax Avenue has multiple modal priorities; it is on the Transit Enhanced Network (Moderate Transit Enhanced Street), Bicycle Lane Network (Tier 3 Bicycle Lane), and Pedestrian Analysis Network.

6th Street is an Avenue II street on the northern border of the site. The road has a three-lane cross section (two westbound lanes and one eastbound lane) with a center median that allows for left-turning vehicles at intersections. There are designated right turn lanes at the eastbound approach to the Fairfax Avenue intersection and at the westbound approaches to the LACMA parking garage and Curson Avenue intersections. Street parking is available along most of the north side of the street, except for where the eastbound turn lane at S Fairfax Avenue is, while parking on the south side of the street is provided for portions of the street east of the LACMA parking garage driveway. The curb-to-curb roadway width is approximately 58 feet, and the posted speed limit is 35 MPH. According to the City's Mobility Plan 2035, within the study area 6th Street has multiple modal priorities; it is on the Neighborhood Enhanced Network (Neighborhood Network west of Wilshire Boulevard), Bicycle Enhanced Network (Tier 1 Protected Bicycle Lanes), and Pedestrian Analysis Network. 6th Street (east of Ogden Drive) is on the City's Vision Zero High-Injury Network.

COLLECTOR STREETS

Collector Streets, according to the City's Mobility Plan 2035, are lower-volume roadways (compared to Avenue I/II/III streets) that are designed to have 66 feet of right-of-way and 40 feet of roadway width.

Curson Avenue is a Collector Street on the eastern edge of the site. The road has a two-lane cross section and a northbound left-turn lane at the W 6th Street intersection. There is no on- street parking allowed on either side of the road. The west side of Curson Avenue fronting the project site between the site driveway and the bend in Curson Avenue is a dedicated loading zone for buses. The curb-to-curb roadway width is approximately 36-40 feet (depending on the presence of the northbound left-turn lane), and there is no posted speed limit. According to the City's Mobility Plan 2035, Curson Avenue south of 8th Street is on the Neighborhood Enhanced Network.

8th Street is a Collector Street south of the project site. The road has a two-lane cross section. Between Fairfax Avenue and Curson Avenue, there is diagonal and parallel parking on the north side of the street, and parallel parking on the south side of the street. The curb-to-curb roadway with is approximately 40-55 feet (depending on the presence of diagonal parking), and there is no posted speed limit.

LOCAL STREETS

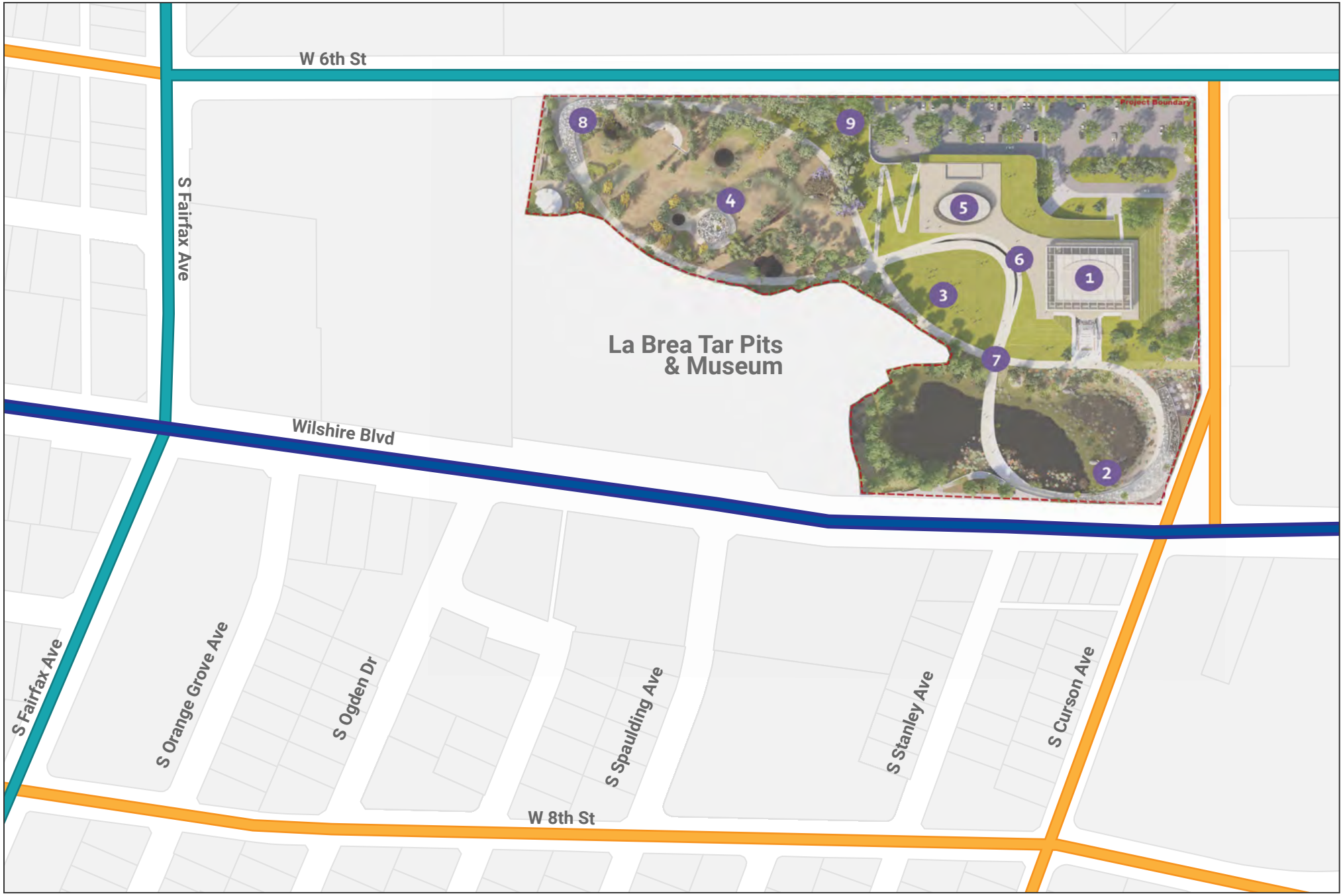
Local Standard streets, according to the City's Mobility Plan 2035, are low volume roadways that are designed to have 60 feet of right-of-way and 36 feet of roadway width.

Ogden Drive is a Local street to the south of the site that intersects with Wilshire Boulevard (Ogden Drive also intersects with 6th Street on the north side of the site, but this is a private roadway with gated access). The road has a two-lane cross section with no marked centerline beyond the immediate intersection area with Wilshire Boulevard, and there are separate northbound left- and right-turn lanes as the street terminates at Wilshire Boulevard. Street parking is allowed on both sides of the street. The curb-to-curb roadway width is approximately 38-48 feet (depending on the presence of turn lanes at Wilshire Boulevard), and there is no posted speed limit.

Spaulding Avenue is a Local street to the south of the site that intersects with Wilshire Boulevard. The road has a two-lane cross section with no marked centerline beyond the immediate intersection area with Wilshire Boulevard. Street parking is allowed on both sides of the street. The curb-to-curb roadway width is approximately 38 feet, and there is no posted speed limit.

Orange Grove Avenue is a Local street south of the project site that intersects with Wilshire Boulevard and with 8th Street. It is a two-lane roadway with no marked centerline. On-street parking is allowed. North of 8th Street, the curb-to-curb with is approximately 35 feet. There is no posted speed limit.

Stanley Avenue is a Local street south of the project site that intersects with Wilshire Boulevard and with 8th Street. It is a two-lane roadway with no marked centerline. On-street parking is allowed. North of 8th Street, the curb-to-curb with is approximately 28 feet. There is no posted speed limit.



Avenue I
Avenue II
Collector

Scale in Feet
0 300
North

LA BREA TAR PITS & MUSEUM

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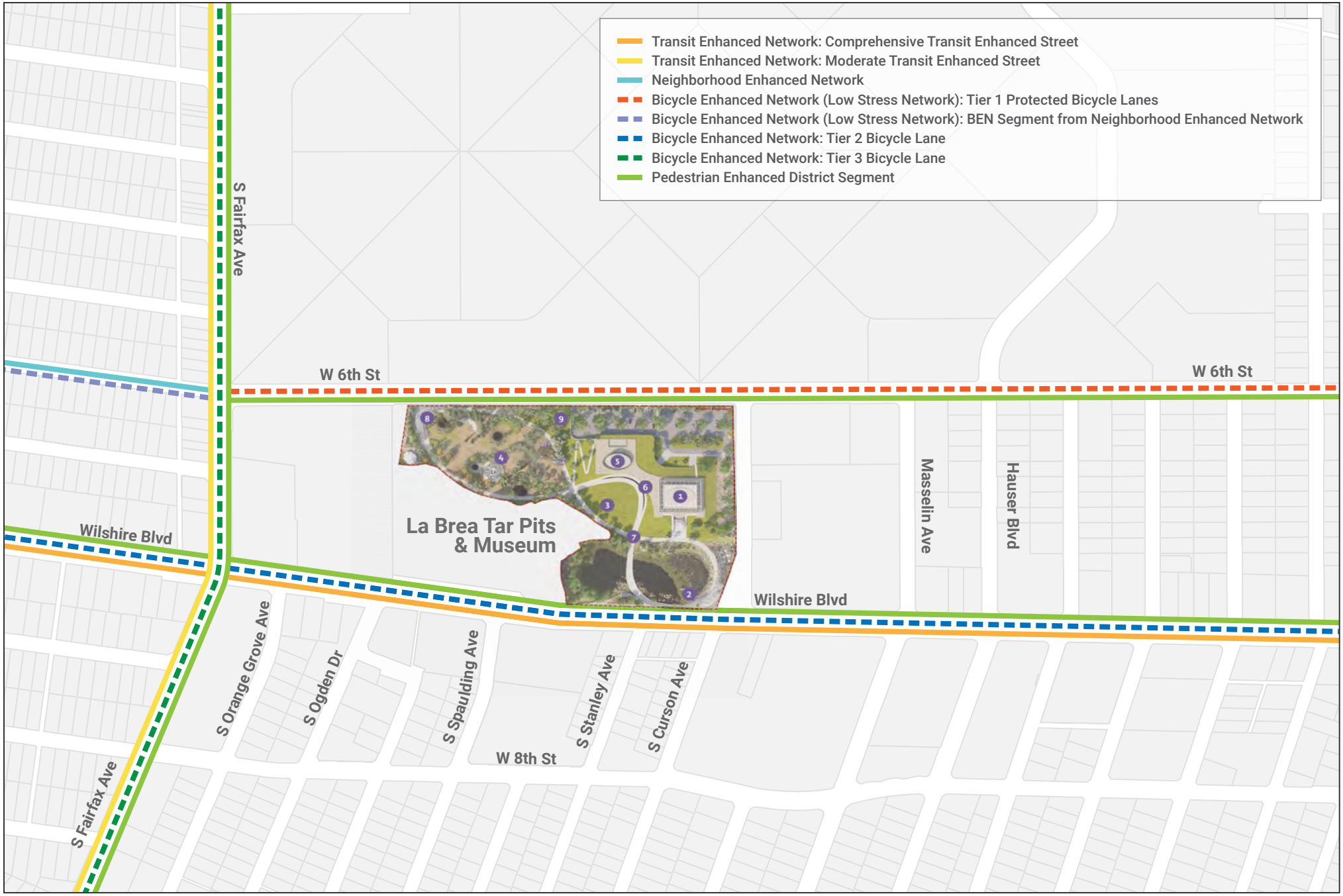
Roadway Classfications

Figure 3



Scale in Feet

0 600

North

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Modal Priorities

Figure 4

PEDESTRIAN FACILITIES

Pedestrian facilities in the study area are shown in Figure 5; pedestrian generators are shown in Figure 6.

The sidewalk network on the site's block and adjacent streets is complete with a mixture of curb-tight and buffered sidewalks around the site. All signalized intersections that touch a portion of the site's block have a complete set of crosswalks, except for the south leg of the Fairfax Avenue/6th Street intersection, where pedestrian crossing is prohibited. There is a midblock crossing with a continental crosswalk and a pedestrian hybrid beacon on 6th Avenue between Ogden Drive and Curson Avenue that aligns with an existing entrance to the La Brea Tar Pits site on the south side of the road. There is also a signalized midblock pedestrian crossing with a continental crosswalk on Wilshire Boulevard west of Fairfax Avenue. The sidewalk network is built out in this area of Los Angeles, including adjacent to the immediate site area.

Crosswalks in the study area are generally high-visibility continental crosswalks. However, all four crosswalks at the Curson Avenue/Wilshire Boulevard intersection are standard crosswalks. High visibility curb ramps with tactile domes are provided at some (but not all) crosswalks in the study area.

LA Metro's Purple (D Line) Extension First Last Mile Plan includes recommendations for pedestrian improvements around the planned Purple Line Wilshire/Fairfax Station. These include:

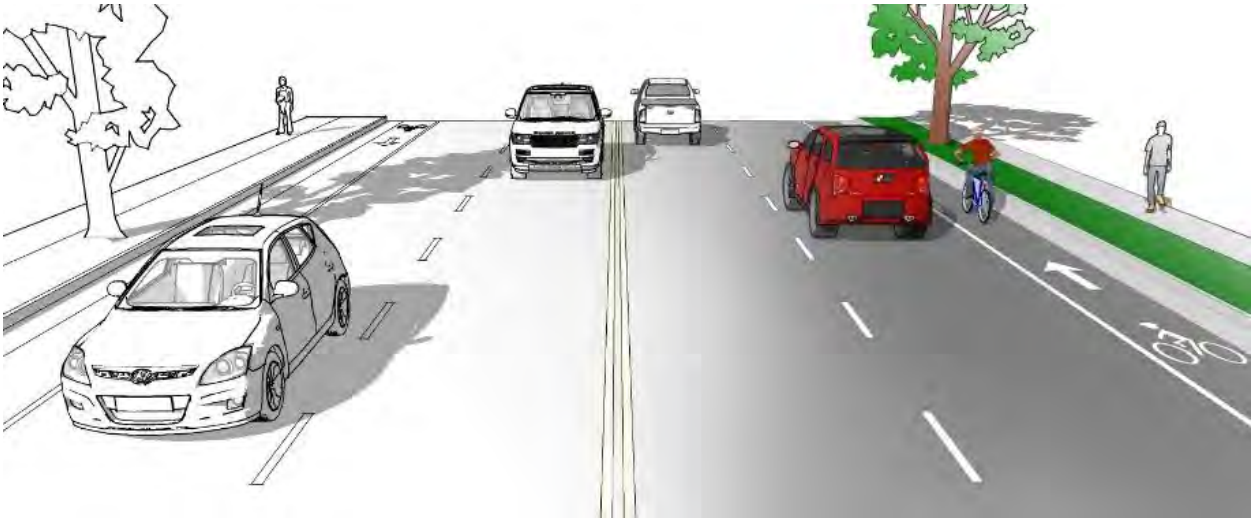
- Improved crosswalks at Ogden/Wilshire and Curson/Wilshire
- Landscaping, shade, pedestrian lighting, and sidewalk/curb extensions along Wilshire Boulevard
- Improved crosswalks at Ogden/8th and Curson/8th; and
- Pedestrian lighting, traffic calming, and wayfinding on 6th Street.

BICYCLE FACILITIES

Bikeways are categorized into four types, as described and depicted in illustrations below.

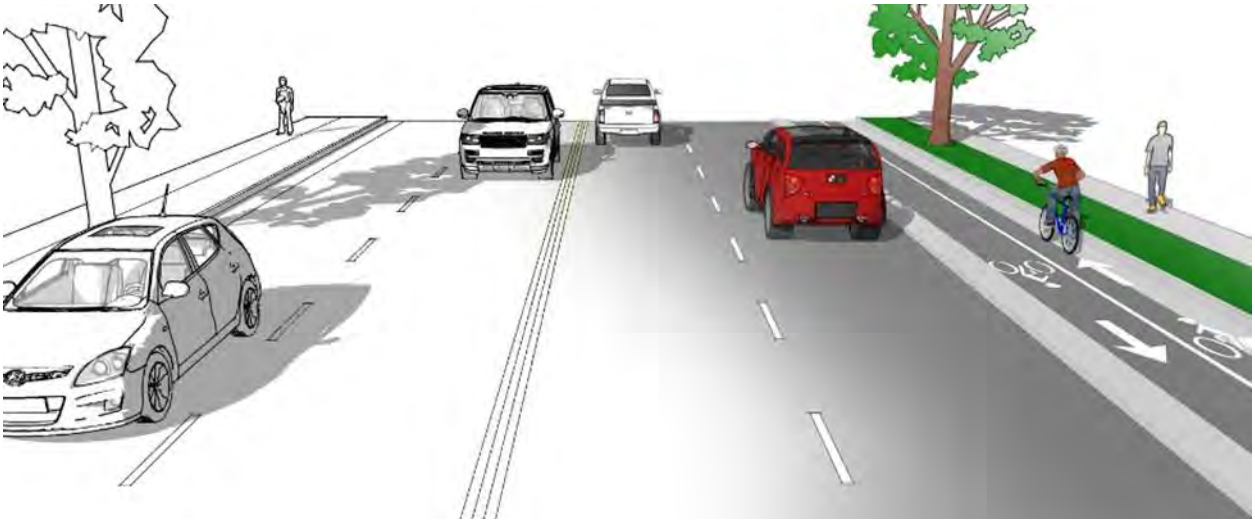
- **Class I Bikeway (Bike Path):** Also known as a shared path or multi-use path, a bike path is a paved right-of-way for bicycle travel that is completely separate from any street or highway (e.g., along a creek or channel).

- **Class II Bikeway (Bike Lane):** A striped and stenciled lane for one-way bicycle travel on a street or highway. This facility could include a buffered space between the bike lane and vehicle lane (referred to as a buffered bike lane) and the bike lane could be adjacent to on-street parking.



- **Class III Bikeway (Bike Route):** A signed route along a street where the bicyclist shares the right-of-way with motor vehicles. This facility can also be augmented using shared-lane markings (also known as sharrows). An enhanced bike route, known as a bicycle boulevard, can include traffic calming treatments to slow down vehicles.

- **Class IV Bikeway (Separated Bike Lane):** Also known as a cycle track or a protected bike lane, this is a bikeway for the exclusive use of bicycles including a separation between the bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking. A cycle track can be one-way or two-way.



As shown in Figure 5, there is currently one bikeway in the study area which are parking-adjacent Class II bike lanes on Hauser Boulevard north of 6th Street. There are several bikeways planned in the area along the following roadways as described below and shown on the figure:

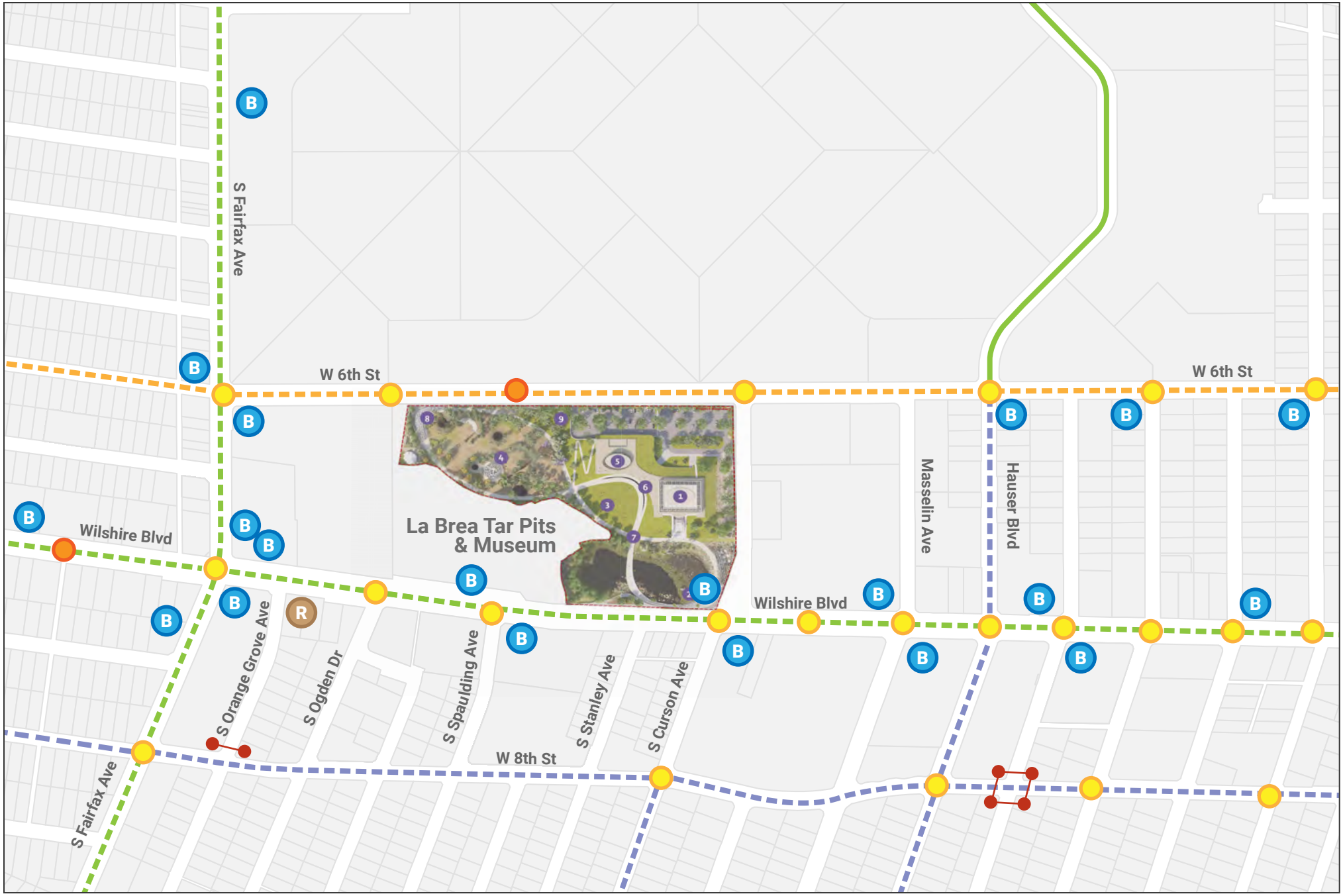
- **6th Street**: Class IV protected bike lanes
- **Wilshire Boulevard**: Class II bike lanes
- **8th Street**: Class III bike route
- **Fairfax Avenue**: Class II bike lanes
- **Curson Avenue**: Class III bike route south of 8th Street
- **Hauser Boulevard**: Class III bike route south of 6th Street

LA Metro's Purple (D Line) Extension First Last Mile Plan includes recommendations for bicycle improvements around the planned Purple Line Wilshire/Fairfax Station. These include:

- Bicycle lanes along 8th Street (this differs from the bike route that is currently proposed)
- Bicycle boulevard along Ogden Drive (the City has not proposed a bikeway along Ogden Drive at this time)
- Bicycle Boulevard along Curson Avenue south of 8th Street (this differs from the bike route that is currently proposed)
- Bicycle friendly intersections at the following intersections: Fairfax/6th, Ogden/6th, Curson/6th, Fairfax/Wilshire, Fairfax/8th, Ogden/8th, and Curson/8th

As shown in Figure 5, there are several bike racks at the site, on the same block as the site, or within a short distance of the site:

- Four inverted-U bike racks on the north side of Wilshire Boulevard between Curson Avenue and Fairfax Avenue;
- Three inverted-U bike racks on the south side of Wilshire Boulevard between Stanley Avenue and Curson Avenue; and
- Two post-and-ring bike racks on the east side of Curson Avenue north of Wilshire Boulevard.



Marked Crosswalk with Traffic Signal
Marked Crosswalk with Pedestrian Signal
Marked Crosswalk with Stop Sign
Existing Bike Lanes
Planned Bike Lanes
Planned Protected Bike Lanes
Planned Bike Routes
Scale in Feet
0
600
North

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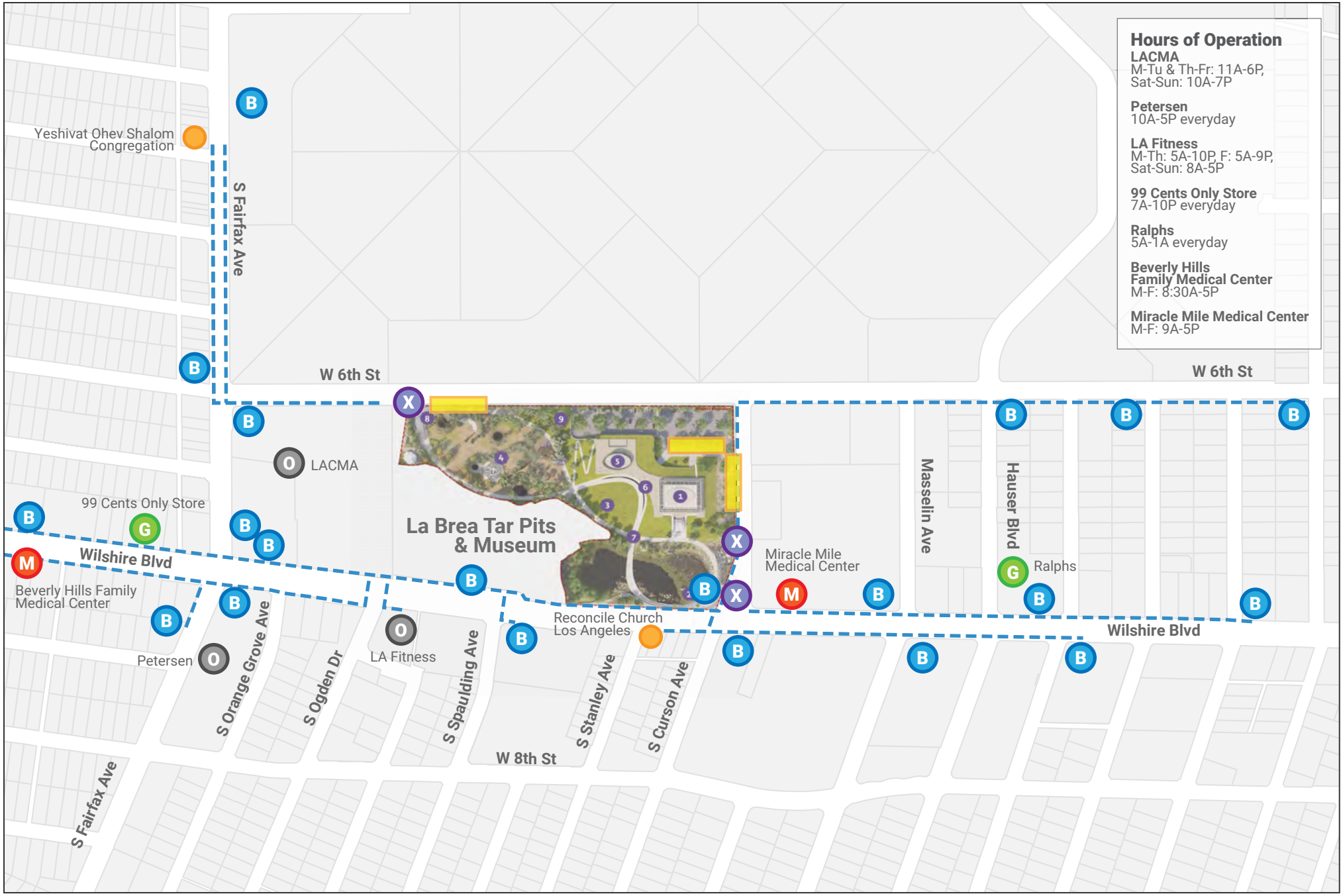
Facilities Inventory

Figure 5



LA BREA TAR PITS & MUSEUM

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Pedestrian Generators

Figure 6

PUBLIC TRANSIT FACILITIES AND SERVICE

The transit system in the study area consists of local bus service, as well as planned heavy rail service. Existing bus stops and the planned rail system are shown in Figure 5.

LA METRO BUS SERVICE

There are three LA Metro bus routes that run on roads that parallel the La Brea Tar Pits Museum site.

- **Line 20 (Downtown LA – Westwood/Santa Monica via Wilshire Boulevard)** runs between Downtown LA and Santa Monica on Wilshire Boulevard along the entire route between these two destinations. Service runs seven days a week; the bus runs 24 hours, with 15-minute headways during daylight hours and 30-minute headways during overnight every day of the week. Stops near the Museum site are located at Wilshire/Spaulding and Wilshire/Curson for both directions of travel.
- **Line 217 (Hollywood/Vine Station – La Cienega Station via Hollywood Boulevard-Fairfax Avenue)** runs between Los Angeles' Los Feliz and Baldwin Hills neighborhoods, on Vermont Avenue, Hollywood Boulevard, and Fairfax Avenue along the west side of the site. Service runs seven days a week; the bus runs on 12-15 minute headways for the majority of the day every day of the week, with longer headways at the beginning and end of service. Stops near the Museum site are located at Fairfax/6th and Fairfax/Wilshire for both directions of travel.
- **Line 720 (Santa Monica – Downtown LA via Wilshire Boulevard)** runs between Downtown LA and Santa Monica on Wilshire Boulevard along the entire route between these two destinations. Service runs seven days a week; the bus runs on 5- to 10-minute headways for the majority of the day, with 15-minute headways during overnight hours of service. This is an express bus with limited stops, so the closest bus stops to the Museum site are at Wilshire/Cloverdale and at Wilshire/Crescent Heights.

As of June 2022, one-way fares for LA Metro buses and trains are $1.75, and a day-pass is $3.50. The table below provides more information on LA Metro fares.

Table 7: LA Metro Fare Information

Pass Type	One-Way Fare	Day Pass	30-Day Pass
Regular Fare	$1.75	$3.50	$50.00
Students (K-12)	$1.00	--	$24.00
College/Vocational	$1.75	--	$43.00
Seniors (62+)	$0.75 (peak) $0.35 (off-peak)	$2.50	$20.00
Persons with Disabilities	$0.75 (peak) $0.35 (off-peak)	$2.50	$20.00
Low-Income	Application-based, fare type will vary based on age, disability, and vocation		

SOURCE: LA METRO, JUNE 2022.

LADOT DASH BUS SERVICE

Los Angeles Department of Transportation (LADOT) runs DASH Fairfax service on Wilshire Boulevard and Fairfax Avenue, connecting to Melrose Avenue and the Cedars-Sinai Medical Center. Service runs seven days a week on 30-minute headways. Weekday service operates from 6:00 AM to 7:30 PM, and weekend service operates from 9:00 AM to 7:00 PM. DASH Fairfax services only westbound on Wilshire Boulevard and northbound on Fairfax Avenue. Stops near the Museum site are located at Wilshire/Curson, Wilshire/Ogden, Wilshire/Fairfax, and Fairfax/6th.

As of June 2022, regular one-way cash fare on DASH services are $0.50 ($0.35 with a TAP card). A 7-day DASH pass is $5.00 and a 31-day DASH pass is $18.00. Seniors, people with disabilities, and Medicare

cardholders can ride DASH for $0.25 one-way ($0.15 with a TAP card). Children can ride DASH services for free.

ANTELOPE VALLEY TRANSIT AUTHORITY

The Antelope Valley Transit Authority, based in the Lancaster and Palmdale area within Los Angeles County's Antelope Valley, provides commuter bus service from Lancaster and Palmdale into Los Angeles. Route 786 (Century City/West Los Angeles) provides four runs from Lancaster and Palmdale into Los Angeles during the morning commute time period, and it provide four runs from Los Angeles to Palmdale and Lancaster during the evening commute time period. The closest stop to the Museum site is located at Wilshire/La Cienega to the west.

As of June 2022, a one-way trip on Route 786 is $10.75, with one-way for seniors, people with disabilities, and Medicare cardholders costing $5.25.

EXISTING BUS STOPS

Existing bus stops in the study area are shown in Figure 5. Bus stops are provided in regular succession along Wilshire Boulevard. The closest bus stop to the project site is located at the northwest corner of the Curson Avenue/Wilshire Boulevard intersection, on the north side of Wilshire Boulevard 65 feet west of the intersection. This stop serves LA Metro Route 20 and LADOT DASH Fairfax service. Passenger amenities consist of a bench, trash can, and shade structure, as well as nearby wayfinding for Hancock Park. Bus stops amenities along Wilshire Boulevard in the study area generally include benches, trash cans, and enhanced crosswalks, but lack shelters, wayfinding, and pedestrian-oriented lighting.

FUTURE HEAVY RAIL SERVICE

LA Metro's D Line subway (formerly known as the Purple Line) is under construction to extend service west along Wilshire Boulevard, with service eventually connecting to the UCLA campus. The project includes tunnels within Wilshire Boulevard right-of-way, adjacent to the project site. When completed, the D Line will operate peak service as often as every six minutes in both directions. Trains may operate 24 hours a day, seven days a week.

The first phase of the D Line extension, which is slated to open in 2024, will include a new stop at Ogden Drive and Wilshire Boulevard (branded as the Wilshire/Fairfax stop). This subway stop will be located directly to the southeast of the Museum site and will be accessible via sidewalks and crosswalks along Wilshire Boulevard.

In addition, LA Metro's Purple (D Line) Extension First Last Mile Plan includes recommendations for to enhance bus stops along Wilshire Boulevard.

EXISTING VEHICLE VOLUMES

Weekday and weekend multimodal (vehicle, bicycle, and pedestrian) counts were collected within the study area to establish the existing transportation context, and to help support the subsequent CEQA and non-CEQA transportation analyses. The study intersections and roadway segments are shown in Figure 2.

EXISTING INTERSECTION VOLUMES

Automobile turning movement counts were collected at the five intersections shown in Table 8. Counts were collected on Thursday, May 12, 2022, during the weekday morning (7:00 AM to 9:00 AM), midday (12:00 PM to 2:00 PM), and evening (4:00 PM to 6:00 PM) peak periods. Counts were also collected on Saturday, May 14, 2022, during the Saturday midday (12:00 PM to 2:00 PM) peak period. These count periods were selected in consultation with City staff.

Table 8: Study Intersections

ID	Intersection	Traffic Control
1	S Ogden Drive/Parking Garage/W 6th Street	Signalized
2	S Curson Avenue/W 6th Street	Signalized
3	S Ogden Drive/Wilshire Boulevard	Signalized
4	S Spaulding Avenue/Wilshire Boulevard	Signalized
5	S Curson Avenue/Wilshire Boulevard	Signalized

Because of the ongoing changes to travel patterns since the start of the COVID-19 pandemic in spring 2020, as well as construction on Wilshire Boulevard during the weekday morning and midday periods, the counts were generally lower than historical counts. The May 2022 intersection counts were compared to data collected between 2012 and 2015. It was found that the weekday AM peak hour counts were an average of 51% higher in previous years compared to 2022; weekday midday counts were 35% higher, weekday PM counts were 28% higher, and Saturday midday counts were 70% higher. Therefore, it was concluded that:

- 51% growth would be applied uniformly to the May 2022 weekday AM peak hour intersection volumes to obtain the adjusted existing conditions volumes.
- 35% growth would be applied uniformly to the May 2022 weekday midday peak hour intersection volumes to obtain the adjusted existing conditions volumes. The exception is the Curson Avenue/6th Street intersection, where May 2022 counts would be used for the weekday midday peak hour since those were higher than historical counts.
- 28% growth would be applied uniformly to the May 2022 weekday PM peak hour intersection volumes to obtain the adjusted existing conditions volumes.
- 70% growth would be applied uniformly to the May 2022 Saturday midday peak hour intersection volumes to obtain the adjusted existing conditions volumes. The exception is the Curson Avenue/6th Street intersection, where May 2022 counts would be used for the Saturday midday peak hour since those were higher than historical counts.

This adjustment methodology was verified and approved by City staff. Traffic count sheets are provided in the appendix.

Figure 7 shows existing traffic controls and lane geometries. The adjusted intersection volumes for each of the four peak periods are shown in Figure 8 through Figure 11.

Figure 7: Existing Traffic Controls and Lane Geometries

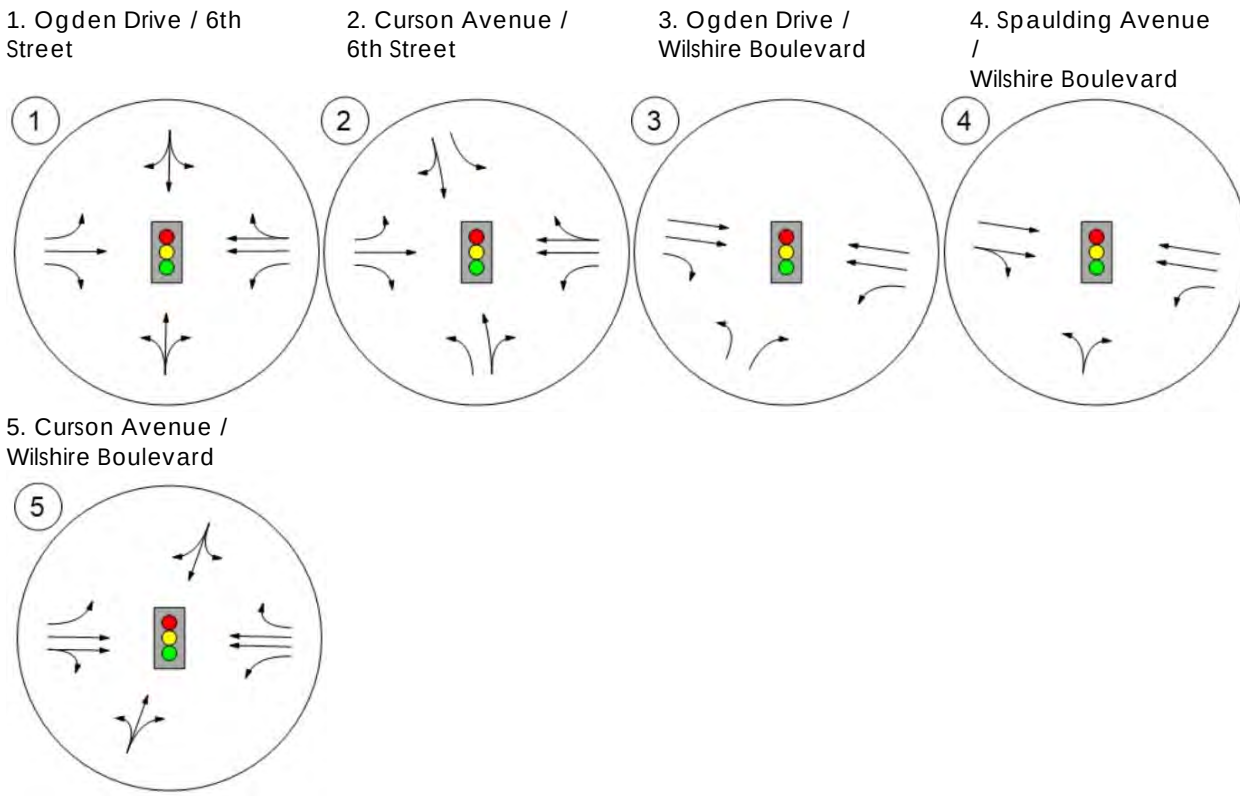


Figure 8: Existing (2022) Weekday AM Peak Hour Traffic Volumes

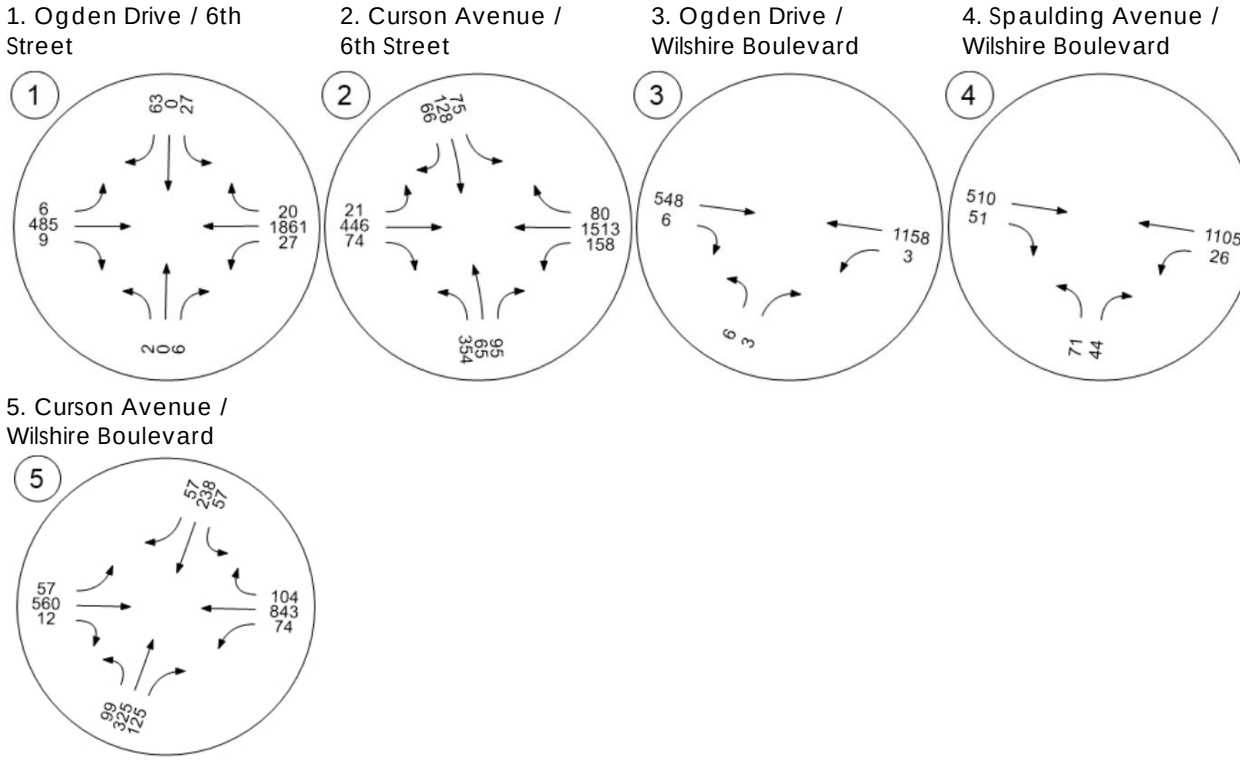


Figure 9: Existing (2022) Weekday Midday Peak Hour Traffic Volumes

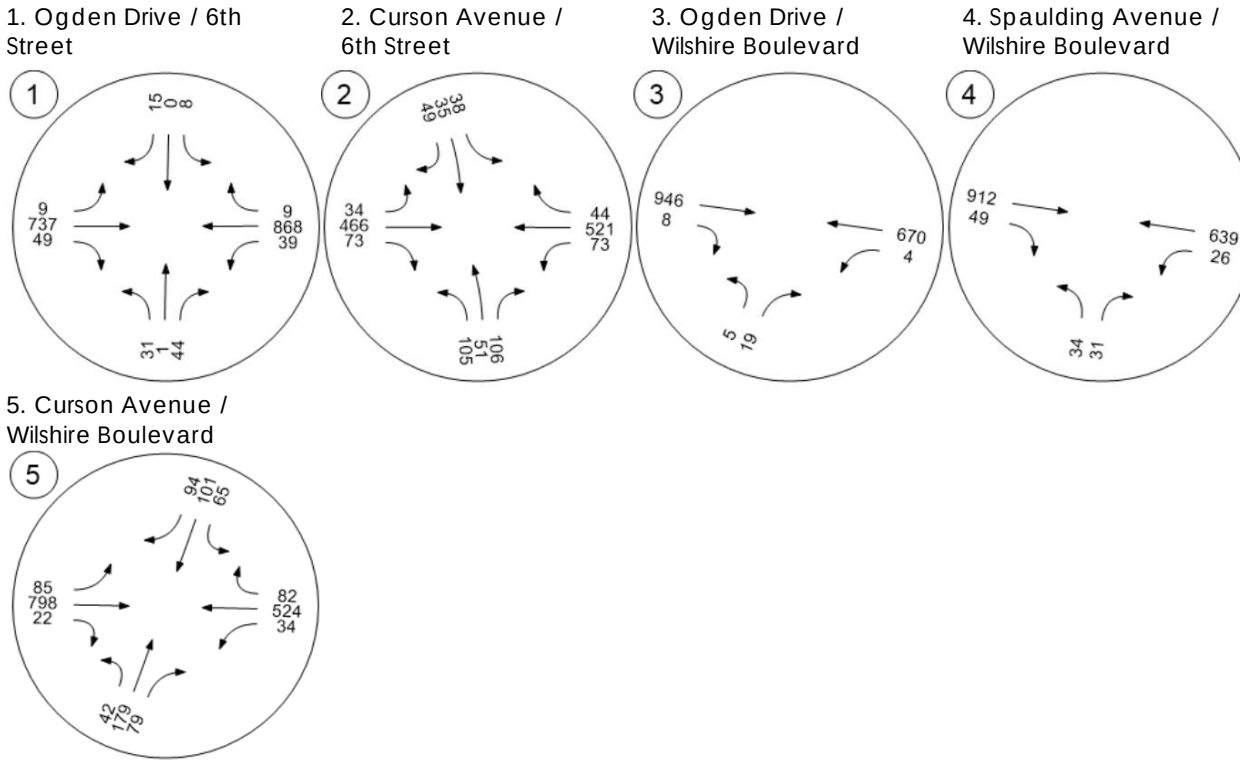


Figure 10: Existing (2022) Weekday PM Peak Hour Traffic Volumes

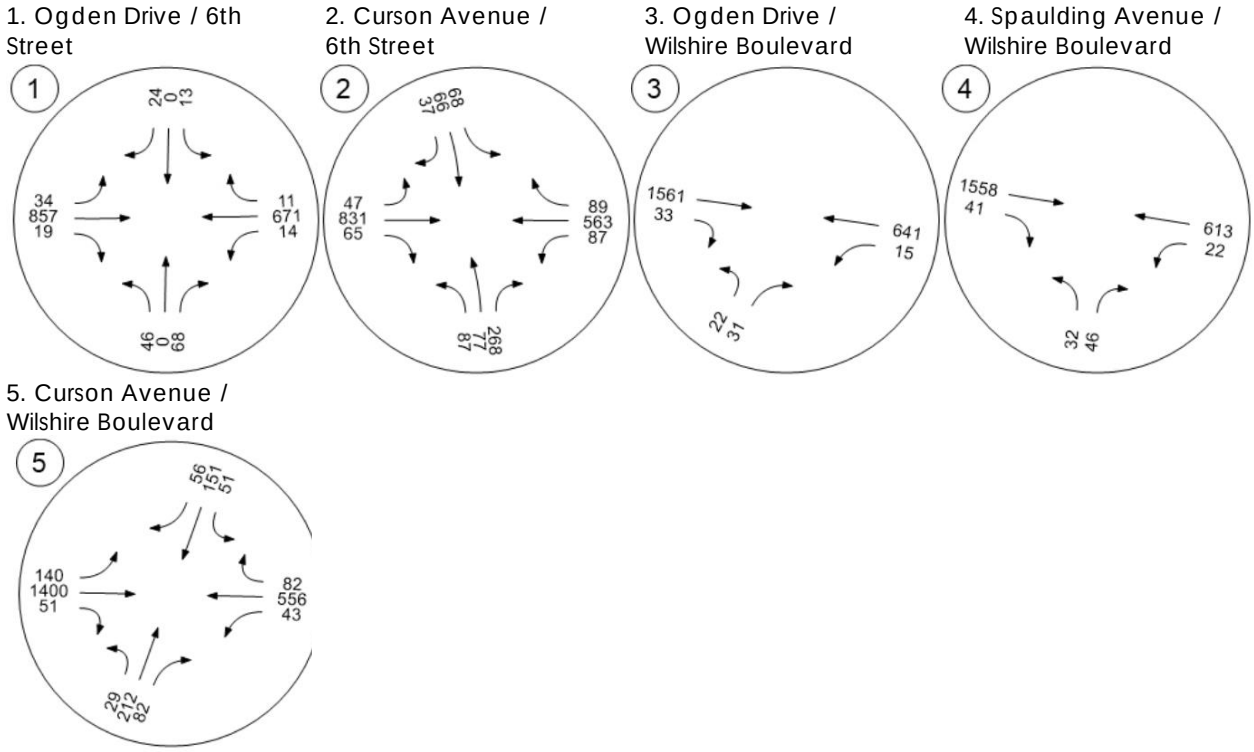
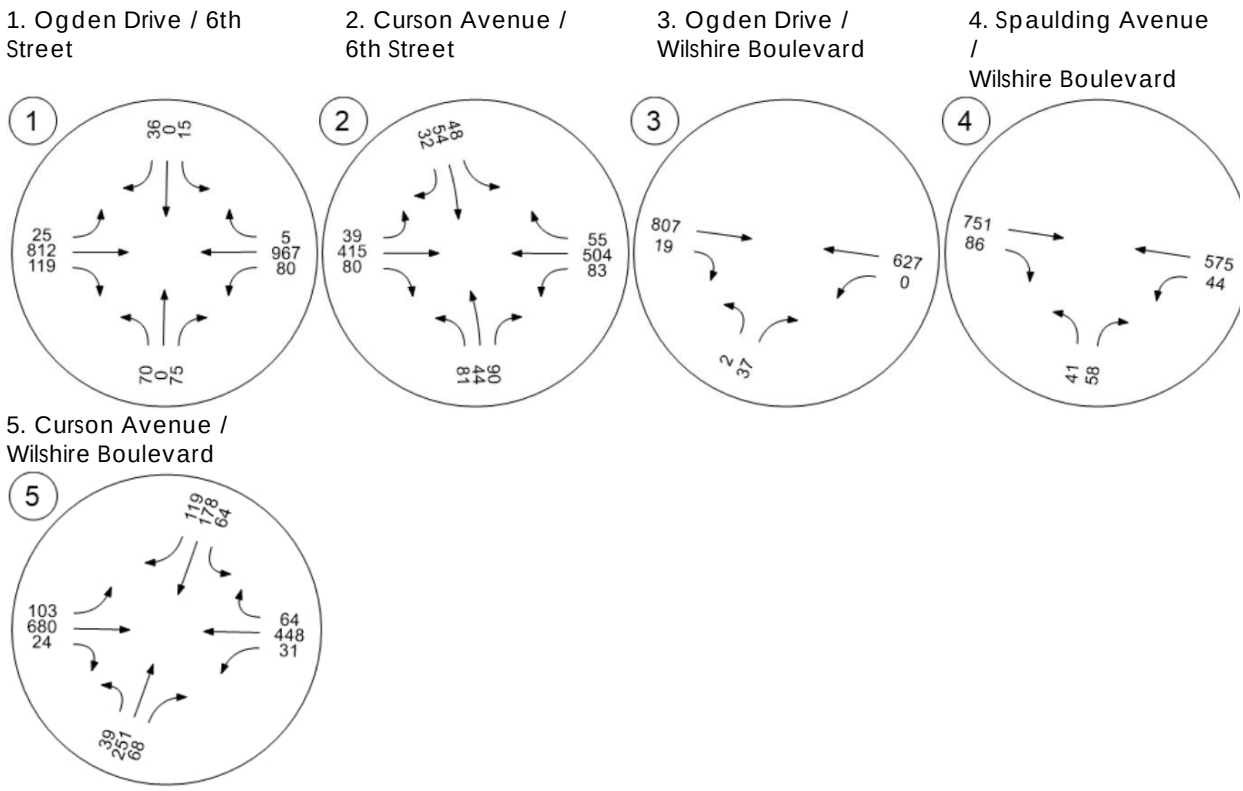


Figure 11: Existing (2022) Saturday Midday Peak Hour Traffic Volumes



EXISTING ROADWAY SEGMENT VOLUMES

24-hour bi-directional vehicle volumes were collected at the seven roadway segments shown in Table 9. Counts were collected on Thursday, May 12, 2022 and Saturday, May 14, 2022. These count periods were selected in consultation with City staff.

Table 9: Study Roadway Segments

Roadway	Extent
8th Street	between Fairfax Avenue and Orange Grove Avenue
8th Street	between Stanley Avenue and Curson Avenue
Orange Grove Avenue	between Wilshire Boulevard and 8th Street
Ogden Drive	between Wilshire Boulevard and 8th Street
Spaulding Avenue	between Wilshire Boulevard and 8th Street
Stanley Avenue	between Wilshire Boulevard and 8th Street
Curson Avenue	between Wilshire Boulevard and 8th Street

Because of the ongoing changes to travel patterns since the start of the COVID-19 pandemic in spring 2020, as well as construction on Wilshire Boulevard during the weekday morning and midday periods, the weekday counts were generally lower than historical counts (historical weekend counts were not available). The May 2022 weekday data was compared to data collected between 2014 and 2016. It was found that the weekday daily volumes along these streets were approximately 36% higher in previous years compared to 2022. Therefore, it was concluded that:

- A 36% growth rate would be applied to the May 2022 weekday daily volumes at locations where historical volumes were higher.

- Since historical weekend counts were not available, the ratio of volumes between weekday and weekend from the 2022 counts was applied to the adjusted weekday volumes.

Traffic count sheets are provided in the appendix. The adjusted weekday and Saturday daily volumes are shown in Table 10.

Table 10: Existing 2022 (Adjusted) Daily Segment Volumes

Roadway	Extent	Weekday Daily Volume	Weekend Daily Volume
8th Street	between Fairfax Avenue and Orange Grove Avenue	7,343	4,780
8th Street	between Stanley Avenue and Curson Avenue	9,262	4,633
Orange Grove Avenue	between Wilshire Boulevard and 8th Street	787	1,154
Ogden Drive	between Wilshire Boulevard and 8th Street	536	931
Spaulding Avenue	between Wilshire Boulevard and 8th Street	2,006	1,372
Stanley Avenue	between Wilshire Boulevard and 8th Street	1,216	784
Curson Avenue	between Wilshire Boulevard and 8th Street	7,013	4,972

SOURCE: NATIONAL DATA AND SURVEYING SERVICES, 2022; KITTELSON & ASSOCIATES, 2022.

EXISTING TRAFFIC OPERATIONS

The adjusted May 2022 intersection volumes were utilized to assess intersection operations for the weekday AM, weekday midday, weekday PM, and Saturday midday peak hours.

EXISTING INTERSECTION LEVELS OF SERVICE

Intersection operations were determined for the study peak hours using the Highway Capacity (HCM) 6th Edition methodology. The HCM methodology assigns a level of service grade to an intersection (LOS) based on the average control delay for vehicles at the intersection, ranging from LOS A to LOS F; LOS A signifies very slight delay with no approach phase fully utilized while LOS F signifies very high delays and congestion, frequent cycle failures, and long queues. For signalized and all-way stop-controlled intersections, the average control delay for all vehicles is assessed; for two-way stop-controlled intersections, the intersection approach with the highest delay is utilized. LOS grades and corresponding delay values under the HCM methodology are provided in the table below.

Table 11: Signalized Intersection Level of Service Standards (HCM Methodology)

Level of Service	Delay Per Vehicle (Seconds)	
	Signalized Intersection	Unsignalized Intersection
A	< 10.0	< 10.0
B	> 10.0 to 20.0	> 10.0 to 15.0
C	> 20.0 to 35.0	> 15.0 to 25.0
D	> 35.0 to 55.0	> 25.0 to 35.0
E	> 55.0 to 80.0	> 35.0 to 50.0
F	> 80.0	> 50.0

SOURCE: HIGHWAY CAPACITY MANUAL.

Existing intersection LOS is provided in Table 12. As shown in the table, all five of the study intersections perform at LOS D or better during the study peak hours.

Table 12: Existing (2022) Intersection Level of Service

Intersection		Peak Hour	Delay (sec)	LOS
1	Ogden/6th	Weekday AM	6.5	A
		Weekday MD	6.5	A
		Weekday PM	7.9	A
		Saturday MD	7.9	A
2	Curson/6th	Weekday AM	35.5	D
		Weekday MD	10.5	B
		Weekday PM	21.8	C
		Saturday MD	10.1	B
3	Ogden/Wilshire	Weekday AM	1.9	A
		Weekday MD	2.6	A
		Weekday PM	4.5	A
		Saturday MD	3.4	A
4	Spaulding/Wilshire	Weekday AM	6.6	A
		Weekday MD	5.0	A
		Weekday PM	6.9	A
		Saturday MD	8.0	A
5	Curson/Wilshire	Weekday AM	24.0	C
		Weekday MD	15.3	B
		Weekday PM	16.3	B
		Saturday MD	18.9	B

SOURCE: KITTELSON & ASSOCIATES, 2022.

EXISTING INTERSECTION QUEUES

In addition to delay-based LOS, existing queues were estimated at the study intersections. Existing queues for each movement for each of the four study periods are shown in Table 13. Storage lengths for turning movements are based on the turn pocket length and excludes the taper. Storage lengths for through movements are measured to the nearest adjacent cross street or crosswalk.

As shown in Table 13, three intersections experience queues that exceed storage for at least one movement (highlighted in yellow). However, these queues do not interfere with any marked crosswalks, nor with bus operations at stops.

Table 13: Existing (2022) Intersection Queuing

Intersection		Movement		Storage (ft.)	AM Queue (ft.)	MD Queue (ft.)	PM Queue (ft.)	Sat. Queue (ft.)
1	Ogden/6th	NB	Left/Thru/Right	70	< 25	46	120	89
		SB	Left/Thru/Right	205	94	< 25	37	30
		EB	Left	100	< 25	< 25	< 25	< 25
			Thru	555	71	161	237	195
			Right	60	< 25	< 25	< 25	< 25
		WB	Left	140	< 25	< 25	< 25	39
			Thru/Right	505	210	72	62	85
2	Curson/6th	NB	Left	110	287	63	44	48
			Thru/Right	790	66	92	181	72
		SB	Left	35	37	< 25	44	29
			Thru/Right	85	81	46	43	44
		EB	Left	100	< 25	< 25	< 25	< 25
			Thru	725	201	119	479	102
			Right	40	27	< 25	< 25	< 25
		WB	Left	95	114	32	89	30
			Thru/Right	575	592	63	118	64
3	Ogden/Wilshire	NB	Left	145	< 25	< 25	< 25	< 25
			Right	145	< 25	< 25	33	42
		EB	Thru	515	< 25	50	161	54
			Right	100	< 25	< 25	< 25	< 25
		WB	Left	115	< 25	< 25	< 25	< 25
			Thru	385	42	31	43	39
4	Spaulding/Wilshire	NB	Left/Right	570	125	70	81	95
		EB	Thru/Right	380	60	104	234	148
		WB	Left	65	< 25	< 25	< 25	< 25
			Thru	500	140	58	59	88
5	Curson/Wilshire	NB	Left/Thru/Right	100	541	258	282	309
		SB	Left/Thru/Right	790	264	232	232	344
		EB	Left	70	49	45	80	63
			Thru/Right	225	166	182	353	175
		WB	Left	105	55	< 25	38	< 25
			Thru	250	247	101	104	99
			Right	50	< 25	< 25	< 25	< 25

SOURCE: KITTELSON & ASSOCIATES, 2022.

BICYCLE AND PEDESTRIAN VOLUMES

Bicycle and pedestrian turning movement counts were also collected at the five study intersections. Counts were collected on Thursday, May 12, 2022, during the weekday morning (7:00 AM to 9:00 AM), midday (12:00 PM to 2:00 PM), and evening (4:00 PM to 6:00 PM) peak periods. Counts were also collected on Saturday, May 14, 2022, during the Saturday midday (12:00 PM to 2:00 PM) peak period. The existing crosswalk-level pedestrian counts and bicycle turning movement counts for the four study periods are shown in Table 14 through Table 17.

Table 14: Pedestrian and Bicycle Volumes (Weekday AM Peak Period)

Intersection		Pedestrian Crossings (by intersection leg)				Northbound Bicycles			Southbound Bicycles			Eastbound Bicycles			Westbound Bicycles		
		N	S	E	W	L	T	R	L	T	R	L	T	R	L	T	R
1	Ogden/6th	12	14	4	6	1	0	0	0	0	2	0	5	0	0	13	0
2	Curson/6th	34	61	42	49	0	2	0	1	4	1	1	3	0	2	8	0
3	Ogden/Wilshire	--	72	0	67	1	--	0	--	--	--	--	3	0	0	6	--
4	Spaulding/Wilshire	--	86	21	7	0	--	0	--	--	--	--	1	0	0	5	--
5	Curson/Wilshire	60	58	36	72	1	2	0	0	3	1	0	2	0	1	7	0

SOURCE: NATIONAL DATA AND SURVEYING SERVICES, 2022; KITTELSON & ASSOCIATES, 2022.

Table 15: Pedestrian and Bicycle Volumes (Weekday Midday Peak Period)

Intersection		Pedestrian Crossings (by intersection leg)				Northbound Bicycles			Southbound Bicycles			Eastbound Bicycles			Westbound Bicycles		
		N	S	E	W	L	T	R	L	T	R	L	T	R	L	T	R
1	Ogden/6th	62	101	46	11	0	0	0	1	0	1	0	2	0	0	5	0
2	Curson/6th	52	86	54	59	0	4	0	1	5	0	2	0	0	0	3	0
3	Ogden/Wilshire	--	260	12	201	3	--	0	--	--	--	--	5	1	0	4	--
4	Spaulding/Wilshire	--	200	36	48	2	--	0	--	--	--	--	3	1	0	4	--
5	Curson/Wilshire	245	181	123	186	0	1	1	2	4	0	4	2	0	1	4	0

SOURCE: NATIONAL DATA AND SURVEYING SERVICES, 2022; KITTELSON & ASSOCIATES, 2022.

Table 16: Pedestrian and Bicycle Volumes (Weekday PM Peak Period)

Intersection		Pedestrian Crossings (by intersection leg)				Northbound Bicycles			Southbound Bicycles			Eastbound Bicycles			Westbound Bicycles		
		N	S	E	W	L	T	R	L	T	R	L	T	R	L	T	R
1	Ogden/6th	64	85	31	28	0	0	0	0	0	0	0	7	0	0	4	0
2	Curson/6th	19	60	20	32	0	5	0	1	2	0	0	8	1	4	4	0
3	Ogden/Wilshire	--	239	9	244	0	--	0	--	--	--	--	19	0	0	9	--
4	Spaulding/Wilshire	--	175	30	63	0	--	0	--	--	--	--	18	1	0	11	--
5	Curson/Wilshire	125	80	76	126	0	6	1	3	4	0	2	17	1	0	10	0

SOURCE: NATIONAL DATA AND SURVEYING SERVICES, 2022; KITTELSON & ASSOCIATES, 2022.

Table 17: Pedestrian and Bicycle Volumes (Saturday Midday Peak Period)

Intersection		Pedestrian Crossings (by intersection leg)				Northbound Bicycles			Southbound Bicycles			Eastbound Bicycles			Westbound Bicycles		
		N	S	E	W	L	T	R	L	T	R	L	T	R	L	T	R
1	Ogden/6th	51	82	24	18	0	0	0	1	0	0	0	5	0	0	6	0
2	Curson/6th	52	110	43	50	0	6	1	0	3	0	0	6	0	2	6	0
3	Ogden/Wilshire	--	196	20	165	0	--	0	--	--	--	--	4	0	0	7	--
4	Spaulding/Wilshire	--	180	101	61	0	--	2	--	--	--	--	4	0	1	8	--
5	Curson/Wilshire	194	127	66	202	0	6	1	0	3	2	1	5	0	1	9	0

SOURCE: NATIONAL DATA AND SURVEYING SERVICES, 2022; KITTELSON & ASSOCIATES, 2022.

RELATED PROJECTS

This transportation study considers the effects of the proposed project in relation to other developments in proximity of the project site that are proposed, approved, or under construction. The related projects were provided by the City as part of the MOU process. Nine related projects are included in this analysis, as shown in Figure 12 and listed below.

1. **LACMA Renovation**: This project is located at 5906 W. Wilshire Blvd., and shares the western half of the block with the proposed project. It proposes replacing four buildings within LACMA East collectively compromising 392,871 gross square feet. Overall, the project would result in a net decrease in the square footage of Museum operations by approximately 5,371 square feet and a reduction in the maximum theater size from over 600 seats to 300 seats.
2. **Mixed-Use Project**: This project is located at 5891 Olympic Boulevard. It will consist of 46 apartments.
3. **Wilshire Curson Project**: This project is located at 5700 -5780 Wilshire Blvd / 712-752 S. Curson Ave / 5721-5773 W. 8th Street / 715-761 S. Masselin. It is currently developed with two, six-story primarily office buildings comprising 1,002,990 square feet of floor area. The project would retain and renovate the southern portion of the existing buildings and would demolish the northern portion of

the two existing office buildings for the addition of approximately 1,923,837 square feet of new floor area consisting of 1,806,237 square feet of office uses and 117,600 square feet of ground floor commercial space. Upon completion, the project would result in a net lot area of 390,092 square feet (8.9 acres) within the project site, with a total floor area of approximately 2,340,552 square feet comprised of 2,222,952 square feet of office floor area and 117,600 square feet of commercial floor area with a floor area ratio (FAR) of 6:1.

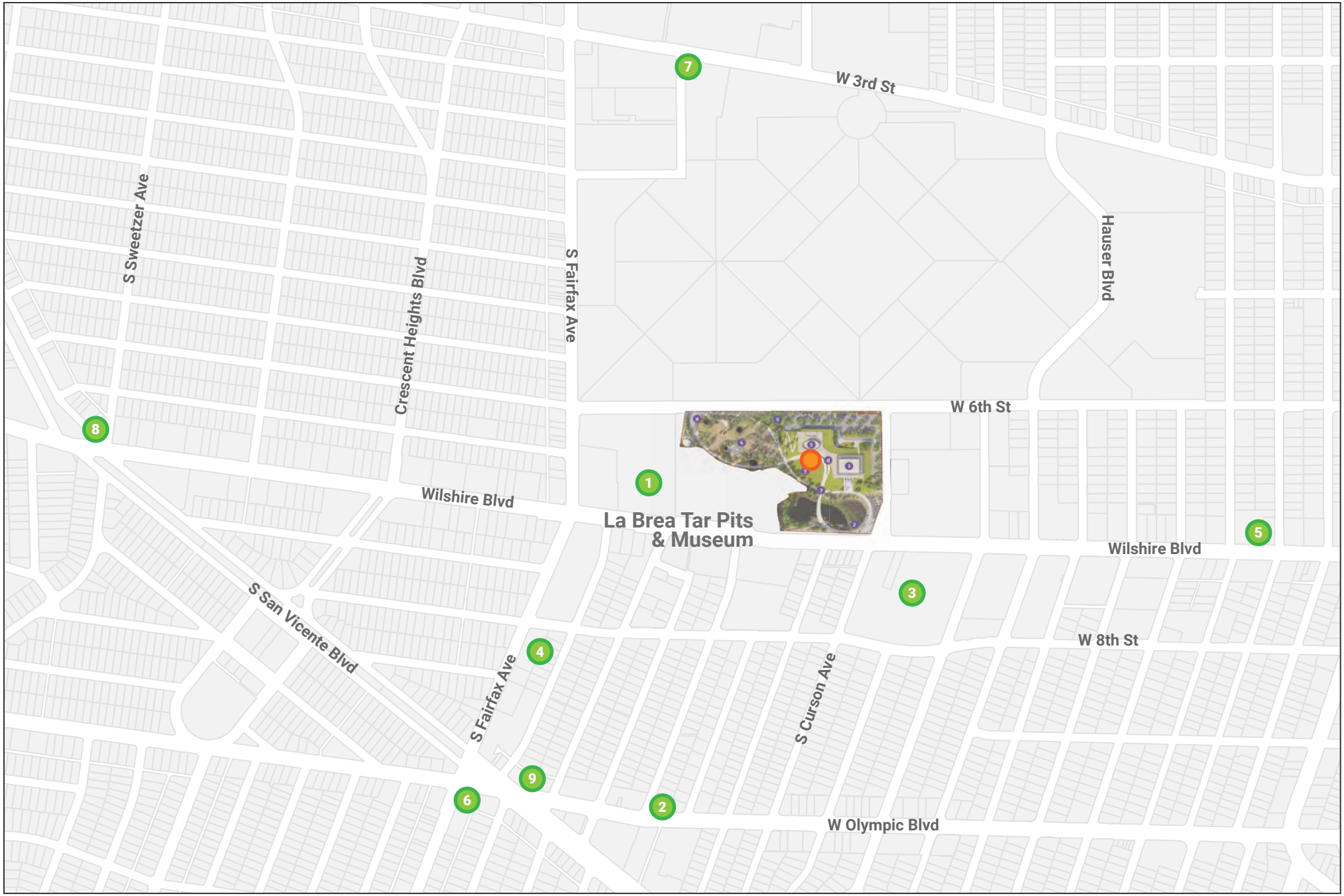
4. **Mixed-Use Residential Project**: This project is located at 800 S Fairfax Avenue. The site currently contains 40 apartments and an existing 3,829 square foot restaurant/lounge. The restaurant/lounge will remain but the existing residential buildings will be replaced with 181 apartments, 28 affordable apartments, and 2,653 square feet of restaurant.
5. **Mixed-Use Residential and Commercial Development**: This project is located at 5411 Wilshire Blvd. It consists of the construction of a new 42-story mixed-use tower including up to 348 dwelling units and approximately 10,176 square feet of ground floor commercial uses. 38 of the dwelling units would be restricted affordable. The project would demolish approximately 38,545 square feet of existing commercial uses.
6. **Olympic + Fairfax Mixed Use Project**: This project is located at 6052-6066 W. Olympic Blvd. It includes construction of a 6-story, mixed-use building containing approximately 5,135 square feet of commercial retail space, 108 apartments, and 12 affordable apartments. It would replace 11,440 square feet of commercial retail uses.
7. **Mixed-Use Project**: This project is located at 6300 W. 3rd Street. It includes demolition of over 150,000 square feet of commercial uses and construction of an 8-story mixed use building consisting of 83,994 square feet of commercial space and 331 dwelling units.
8. **San Vicente Medical/Commercial Project**: This project is located at 650-676 S. San Vicente Blvd. The project proposes 140,305 square feet of medical office space, 4,000 square feet of restaurant/retail space, and 1,000 square feet for other commercial uses, such as a pharmacy. This will include the demolition of an existing 5,738 square-foot, vacant educational building and an 8,225 square foot Big 5 Sporting Goods store.
9. **Olympic Boulevard Mixed-Use Project**: This project is located at 6001-6011 West Olympic Blvd. The proposed project includes the construction of a mixed-use building with 1,596 square feet of ground floor retail, 51 apartments, and 6 affordable apartments. It includes the demolition of 8,488 square feet of retail and 6 apartments.

Estimated trip generation for these nine related projects is provided in Table 18. Trip generation for the related projects were determined through a number of methods:

- Provided by the City during the MOU process
- Obtained from the relevant project transportation studies or memos
- City of Los Angeles-published trip generation rates for affordable housing
- Trip generation rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition*

Trip generation rates are typically not provided for the weekday midday and Saturday midday peak hours. Therefore, it was assumed that weekday midday trip generation was 77% of the weekday PM trip generation, and Saturday midday trip generation was 65% of weekday PM trip generation based on study area traffic volumes. This assumption was not applied to the LACMA Renovation project since that project's transportation study included weekday and Saturday midday trip generation estimates.

The trip generation for related projects is conservative by not applying negative net new trips and instead assuming those to be zero. Accordingly, a hyphen in a cell of the table denotes that the related project generates either zero or negative net new trips for that specific time period and inbound/outbound trip generation.



LA BREA TAR PITS & MUSEUM

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Related Project Locations

Figure 12

Table 18: Related Projects Trip Generation

Project	Wkdy. Daily	Wkdy. AM			Wkdy. Midday			Wkdy. PM			Sat. Daily	Sat. Midday		
		In	Out	Total	In	Out	Total	In	Out	Total		In	Out	Total
LACMA Renovation	668	43	2	45	27	33	60	15	53	68	763	34	41	75
Mixed-Use Project	310	4	14	18	11	7	18	14	9	23	209	9	6	15
Wilshire Curson Project	17,576	1,692	261	1,953	378	1,283	1,661	491	1,666	2,157	8,176	319	1,083	1,402
Mixed-Use Residential Project	786	27	46	73	36	24	60	48	31	79	913	31	20	51
Mixed-Use Residential and Commercial Development	--	--	41	41	1	--	--	1	--	--	--	1	--	--
Olympic + Fairfax Mixed Use Project	--	--	12	12	3	2	5	3	3	6	--	2	2	4
Mixed-Use Project	1,609	49	93	142	51	16	67	66	21	87	762	43	14	57
San Vicente Medical/Commercial Project	5,374	364	108	472	141	304	445	183	395	578	2,146	119	257	376
Olympic Boulevard Mixed-Use Project	99	6	3	9	4	--	4	5	--	5	30	3	--	3

SOURCE: CITY OF LOS ANGELES; INSTITUTE OF TRANSPORTATION ENGINEERS; KITTELSON & ASSOCIATES, 2022.

NOTE: A HYPHEN DENOTES THAT THE RELATED PROJECT DOES NOT GENERATE NET NEW TRIPS FOR THAT TIME PERIOD AND/OR DIRECTION.

Section 4 — CEQA Analysis

CEQA TRANSPORTATION ANALYSIS

This chapter details the CEQA transportation analysis of potentially significant impacts, based on thresholds and methodologies from Section 2 of the City's TAG. Potentially significant transportation impacts were assessed under the following three thresholds:

- **Threshold T-1:** Conflicting with Plans, Programs, Ordinances, or Policies
- **Threshold T-2:** Causing Substantial Vehicle Miles Traveled
- **Threshold T-3:** Substantially Increasing Hazards Due to a Geometric Design Feature or Incompatible Use

THRESHOLD T-1

Under Threshold T-1 (Conflicting with Plans, Programs, Ordinances, or Policies), proposed projects should be analyzed to identify potential conflicts with adopted City plans and policies. If there is a conflict, improvements that prioritize access for and improve the comfort of people walking, bicycling, and riding transit in order to provide safe and convenient streets for all users should be identified.

The City has prepared criteria to identify which projects must check for consistency with major City plans and policies. The City has also prepared a Plan Consistency Worksheet to guide the plan consistency analysis.

SCREENING

If the proposed project requires a discretionary action, and the answer is yes to at least one of the screening questions under Threshold T-1, then a plan consistency analysis is required.

- Does the project require a discretionary action that requires the decision maker to find that the decision substantially conforms to the purpose, intent and provisions of the General Plan?
- Is the project known to directly conflict with a transportation plan, policy, or program adopted to support multimodal transportation options or public safety?
- Is the project required to or proposing to make any voluntary modifications to the public right-of-way (i.e., dedications and/or improvements in the right-of-way, reconfigurations of curb line, etc.)?

The proposed project requires a discretionary action. It also proposes modifications to the public right-of-way: a new parking lot driveway and loading zone on 6th Street (classified as an Avenue II) and modification to the existing loading zone on Curson Avenue (a Collector). Therefore, further analysis is required.

IMPACT CRITERIA AND METHODOLOGY

Impact Threshold T-1 is as follows:

- **Threshold T-1**: Would the project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities?

The City of Los Angeles has adopted programs, plans, ordinances, and policies that establish the transportation planning framework for all travel modes. The overall goals of these policies are to achieve a safe, accessible, and sustainable transportation system for all users. The City has prepared a Plan Consistency Worksheet with questions to help guide whether the proposed project would conflict with these programs, plans, ordinances, and policies. The worksheet's yes/no questions must be paired with substantiating information to help determine whether a conflict would take place.

The step-by-step impact analysis below is based on the City's consistency worksheet, which is included in the appendix to this report.

IMPACT ANALYSIS

Mobility Plan 2035 PROW Classification Standards for Dedications and Improvements

While the project includes new construction along Wilshire Boulevard (an Avenue I) and 6th Street (an Avenue II), the property is not zoned for R3 or less restrictive zoning. Therefore, the project does not conflict with the dedication and improvement requirements that are needed to comply with the Mobility Plan 2035 Street Designations and Standard Roadway Dimensions.

Mobility Plan 2035 PROW Policy Alignment with Project-Initiated Changes

Given that the project includes physically modifying the curb placement along Curson Avenue, City plans and policies were reviewed in light of the proposed physical changes to determine if the City would be obstructed from carrying out the plans and policies. Curson Avenue along the project frontage is not on the High Injury Network. It is not a part of one of the designated multimodal networks. There are no existing or planned transit lines, transit stops, or bikeways along this segment. With the proposed change, the existing sidewalk would be maintained. The project proposes to modify the curb line to create a bay for a section of curb that is already designated as a bus zone, in place of the existing landscaped area. This moves loading/unloading out of the travel lanes to separate it from the adjacent travel lane.

The proposed project also includes a new driveway on 6th Street (an Avenue II). However, this does not result in exceeding 1 driveway per every 200 feet along the Avenue II frontage, locating it within 150 feet of the intersecting street, or locating it near a mid-block crosswalk.

The project would not conflict with plans or policies that govern the Public Right-of-Way.

Network Access

The project does not propose to vacate or otherwise restrict public access to a street, alley, or public stairway. It does not create a cul-de-sac and is long located adjacent to an existing cul-de-sac. Therefore, the project would not conflict with a plan or policies that ensures access for all modes of travel.

Parking Supply and Transportation Demand Management

The project would not propose a supply of on-site parking that exceeds the baseline amount as required in the Los Angeles Municipal Code (LAMC), since no increase in the on-site parking supply is anticipated and the overall Museum square footage is increasing. Therefore, the project would not conflict with parking management policies.

The LAMC bicycle parking requirements for institutional uses are 1 short-term parking space per 10,000 of floor area, and 1 long-term parking space per 5,000 square feet of floor area. Since the project includes a net increase of 42,000 square feet, this means that 4 short-term spaces and 8 long-term spaces are required. At this time, the site plan is conceptual and therefore does not indicate the amount nor location of bike parking. Therefore, the project may conflict with the LAMC requirements for bicycle parking.

The TDM Ordinance requires projects between 25,000 and 50,000 square feet to provide a transportation information display with public transit information, contact info for rideshare and transit, ridesharing promotional material, bike route and facility information, and listing of on-site services or facilities. At this time, the site plan is conceptual and does not indicate the location of this required TDM measure. Therefore, the project may conflict with the LAMC requirements for TDM.

Consistency with Regional Plans

The project was reviewed to determine potential inconsistencies with greenhouse gas (GHG) reduction targets forecasted in the Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS).

The project was analyzed using a total vehicle miles traveled (VMT) threshold (as opposed to an efficiency-based impact threshold). The detailed VMT analysis is provide under Threshold T-2. The project functions as a regional attraction and would result in a net increase in regional VMT. Since the project would result in a net increase in VMT, further evaluation was necessary to determine whether this project would be inconsistent with VMT and GHG reduction goals of the SCAG RTP/SCS.

It was determined that without mitigation measures, the project may be inconsistent with SCAG's goals related to improving mobility and accessibility, ensuring safety, maximizing transportation productivity, encouraging active transportation, and improving air quality. The proposed project does not include transportation improvements to encourage and improve active transportation and public transit outside of on-site access and circulation improvements. The relevant RTP/SCS goals that the project may conflict with are as follows:

- Improve mobility, accessibility, reliability, and travel safety for people and goods
- Enhance the preservation, security, and resilience of the regional transportation system
- Increase person and goods movement and travel choices within the transportation system
- Reduce greenhouse gas emissions and improve air quality
- Leverage new transportation technologies and data-driven solutions that result in more efficient travel

Therefore, it was determined that the project would be inconsistent with regional plans related to mobility and GHG reductions.

The proposed project would result in a **significant impact** related to consistency with plans, programs, ordinances, or policies.

CUMULATIVE IMPACT ANALYSIS

The analysis conducted above was reviewed to determine if cumulative impacts may result from the proposed project in combination with related projects in the study area.

- **Mobility Plan 2035 PROW Classification Standards for Dedications and Improvements**: The LACMA Renovation is a related project that shares the block as well as 6th Street and Wilshire Boulevard frontages with the proposed project. However, while the LACMA Renovation also includes new construction along Wilshire Boulevard (an Avenue I) and 6th Street (an Avenue II), the property is not zoned for R3 or less restrictive zoning. Therefore, cumulative conflicts are not anticipated.
- **Mobility Plan 2035 PROW Policy Alignment with Project-Initiated Changes**: Related projects in the study area do not propose curb modifications and new driveways in close proximity to the proposed project. Therefore, cumulative conflicts are not anticipated.
- **Network Access**: The related projects in the study area do not propose to vacate or restrict public access or create cul-de-sacs in proximity of the proposed project. Therefore, cumulative conflicts are not anticipated.
- **Parking Supply and Transportation Demand Management**: It is not anticipated that related projects in the study area will conflict with the City's parking management policies (either through providing sufficient parking supply or implementing parking management strategies). The potential project shortcomings related to bicycle parking and TDM requirements would be exacerbated by related projects in the study area. Therefore, cumulative conflicts are anticipated.
- **Consistency with Regional Plans**: The LACMA Renovation, located directly to the west of the proposed project and sharing the city block, is similarly a Museum that serves as a regional

attraction and would likely result in a net increase in regional VMT. Therefore, cumulative conflicts with regional plans related to mobility and GHG reductions are anticipated.

The proposed project would contribute to a **significant cumulative impact** related to consistency with plans, programs, ordinances, or policies.

MITIGATION

Given that the project would conflict with regional plans related to mobility and GHG reductions (and potentially with LAMC requirements for bicycle parking and TDM) the proposed project would result in a significant impact related to consistency with plans, programs, ordinances, or policies, and would contribute to a significant cumulative impact related to consistency with plans, programs, ordinances, or policies. Therefore, **Mitigation Measure #1** is proposed, detailed below.

Mitigation Measure #1 Transportation Demand Management (TDM) Program

To reduce Museum employee and visitor vehicle trips and increase alternative modes such as walking, bicycling, public transit, and rideshare, the proposed project shall prepare and implement a TDM program. The program shall be developed in consultation with LADOT.

The proposed project will designate an existing member of staff as the on-site TDM Coordinator. This coordinator shall be responsible for monitoring and tracking employee and visitor mode share and annual reporting to LADOT.

<u>Employee Strategies</u>

Information shall be distributed to employees and displayed on a bulletin board, display case, or kiosk (displaying transportation information) where the greatest number of employees are likely to see it. The following measures may be applied to reduce employee vehicle trips and VMT:

- Provide a transportation information bulletin board on-site with public transit information, contact information for rideshare and transit, ridesharing promotional material, bike route and facility information, and listing of on-site services or facilities.
- Provide facilities on-site to support bicycling to work, such as secure bike parking, showers, and lockers.
- Encourage and support participation in LA Metro vanpool, including subsidies for participation.
- Implement paid parking for employees.
- Subsidize transit passes.
- Offer flexible work schedules and telecommuting, when feasible.

<u>Visitor Strategies</u>

Transportation information for visitors should be displayed on the Museum's website and distributed with physical marketing materials. The following measures may be applied to reduce visitor vehicle trips and VMT:

- Advertise and offer discounted Museum tickets for visitors who use public transit or a bicycle to visit the project.
- Provide and maintain secure on-site bicycle parking for visitors, and monitor usage to determine if additional bicycle racks are needed.
    - Provide wayfinding signage directing bicyclists from the visitor entrances to where on-site bicycle parking is located.
    - Ensure bicycle parking is well lit and monitored by staff.
- Continue to have paid parking for visitors.
- Coordinate with LA Metro to improve transit access and user comfort and encourage visitors to take local bus service or the future Purple Line extension to the Museum, through the following measures:

  - Improve pedestrian wayfinding between the planned Purple Line station, local bus stops, and the Museum.
  - Implement bus stop improvements such as shelters along Wilshire Boulevard bus stops that would be used by Museum visitors.
  - Coordinate with LA Metro and the City of Los Angeles to ensure that safe and comfortable pedestrian facilities (such as ADA curb ramps and continental crosswalks) are available between local bus stops and the project entrances, including at the Curson Avenue/ Wilshire Boulevard intersection.
- Coordinate with the City of Los Angeles to implement planned bikeways in the vicinity of the project site, and contribute to the implementation of the bikeways. This includes planned bikeways along Wilshire Boulevard and 6th Street.

Implementation of Mitigation Measure #1 would encourage employees and visitors to reduce their vehicle trips, and contribute to VMT and GHG reduction goals. This measure also supports multimodal connectivity in the study area. With the implementation of Mitigation Measure #1, the impact related to consistency with plans, programs, ordinances, or policies would be reduced to **less than significant with mitigation**. In addition, the cumulative impact related to consistency with plans, programs, ordinances, or policies would be reduced to **less than significant with mitigation**.

THRESHOLD T-2

Under Threshold T-2 (Causing Substantial Vehicle Miles Traveled), proposed projects should be analyzed to assess whether they would cause substantial vehicle miles traveled (VMT). If an VMT impact is identified, measures should be identified to reduce vehicle trips and vehicle trip lengths.

The City has prepared screening criteria to identify which projects must check for VMT impacts. In addition, the proposed project is a nonstandard use. The methodology and impact criteria to analyze the project's potential VMT impacts is detailed in this section.

SCREENING

If the proposed project requires a discretionary action, and the answer is no to at least one of the screening questions below, then a "no impact" determination can be made without further VMT analysis.

- Would the land use project generate a net increase of 250 or more daily vehicle trips?
- Would the project generate a net increase in daily VMT?

The proposed project requires a discretionary action. In addition, as detailed in the "Project Description" section of this report, the additional Museum square footage is expected to generate 1,293 net new weekday daily vehicle trips and 1,679 net new Saturday daily vehicle trips.

A determination of no net increase in daily VMT cannot be made without a full VMT analysis. Since the project is a non-standard use with unique trip generation patterns, neither the City's VMT calculator tool nor the City's Travel Demand Forecasting (TDF) model be used for this determination. Based upon consultation with City staff, it was determined that an off-model VMT analysis using visitor zip code data would be appropriate for conducting a full VMT impact analysis.

Therefore, this project cannot be screened out of a VMT analysis under Threshold T-2.

IMPACT CRITERIA AND METHODOLOGY

Impact Threshold T-2 is as follows:

- **Threshold T-2**: For a land use project, would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1)?

The City of Los Angeles has adopted the following VMT impact criteria for common project types:

- For residential projects, the project would generate household VMT per capita exceeding 15% below the existing average household VMT per capita for the Area Planning Commission (APC) area in which the project is located.
- For office projects, the project would generate work VMT per employee exceeding 15% below the existing average work VMT per employee for the APC in which the project is located.
- For regional serving projects including retail projects, entertainment projects, and/or event centers, the project would result in a net increase in VMT.
- For other land use types, measure VMT impacts for the work trip element using the criteria for office projects above.

Trips associated with uses such as event centers and regional-serving entertainment venues are typically discretionary trips made by individuals, which may be substitute or new trips. For such projects, VMT analyses should determine if the project would attract regional trips and as a result increase total VMT.

The proposed project currently serves as regional attraction; with the proposed expansion, it will continue to serve that role. Therefore, in consultation with City staff, this report will analyze if the proposed project would result in a net increase in VMT.

Since tools such as the City's VMT calculator tool and the City's TDF model are not sensitive to unique land uses such as a regional Museum, a project-specific, customized approach is required. This report's methodology to analyzing the net change in total VMT resulting from the project is as follows:

- Obtain the average recreation trip length from the 2012 California Household Travel Survey (CHTS). The CHTS provides zip code-based household data including mode choice and trip lengths. Information is further broken down by trip purpose (home, work, school, errands, dining, shopping, and recreation). The average recreation trip length will be obtained for the zip codes encompassing Los Angeles and Orange Counties.
- Estimate the average trip length for Museum visitors in fiscal year 2018, using visitor's reported zip codes. This will be estimated for visitors from zip codes within Los Angeles and Orange Counties, since they are more likely to make a unique, unlinked driving trip to the Museum.
- Compare existing visitors' average trip lengths to the average trip length for recreation-related trips in the region.
- Since regional attractions such as the Museum may be discretionary and substitute trips, a visitor average trip length that is longer than the regional average recreation trip length could mean that as recreational trips are rerouted to visit the expanded Museum, total regional VMT would increase. Conversely, a visitor average trip length that is shorter than the regional average recreation trip length could mean that as trips are rerouted to the expanded Museum, total regional VMT would decrease.

IMPACT ANALYSIS

The CHTS average trip lengths by trip purpose for households in Los Angeles County and Orange County are provided in Table 19. As shown in the table, the average recreation trip length is 6.65 miles.

Table 19: Average Trip Lengths by Trip Purpose (Los Angeles and Orange Counties)

Trip Purpose	Average Trip Length
Home	5.83
Work	9.76
School	3.33
Errands	5.88
Dining	6.13
Shop	3.61
Recreation	**6.65**
Other	7.36
All Trips	6.35

SOURCE: CALIFORNIA HOUSEHOLD TRAVEL SURVEY

Ticketing information and reported zip codes (for visitors from Los Angeles County and Orange County zip codes) from fiscal year 2018 were used to estimate the average visitor trip length. Visitor zip code information utilized in this analysis is included in the appendix. According to this subset of fiscal year 2018 visitors, the average trip length per visitor was 19.70 miles.

The average visitor trip length (19.70 miles) is higher than the average recreation trip length (6.65 miles). Visitors to the Museum travel approximately 196% longer than the average recreation trip in Los Angeles and Orange Counties. Given that Museum visitor trips are longer than regional recreation trip lengths, additional visitor trips to the Museum due to the expansion would result in a net increase in total VMT.

Therefore, the proposed project would result in a **significant impact** related to causing substantial vehicle miles traveled.

Note, the Page Museum is one of a number of museums in the study area. It is expected that a portion of visitors to the study area will visit multiple museums in a single visit. This includes the additional visitors to the area due to the Museum expansion; a portion of the increase in visitors could come from other nearby museums such as LACMA. Therefore, the VMT assessment utilized for the impact findings under Thresholds T-1 and T-2 is conservative in that it assumes new visitors generated by the Museum expansion would exhibit the same trip length patterns as existing visitors to the site.

CUMULATIVE IMPACT ANALYSIS

The analysis conducted above was reviewed to determine if cumulative impacts may result from the proposed project in combination with related projects in the study area.

Other projects in the study area are generally residential, office, and retail projects. However, the LACMA renovation, located directly to the west of the proposed project and sharing the city block, is similarly a Museum that serves as a regional attraction and would likely result in a net increase in regional VMT. Therefore, cumulative increases in VMT are anticipated.

Therefore, the proposed project would contribute to a **significant cumulative impact** related to causing substantial vehicle miles traveled.

MITIGATION

Given that the project would result in a net increase in VMT, the proposed project would result in a significant impact related to causing substantial vehicle miles traveled. **Mitigation Measure #1**, which requires the project to implement a TDM program and coordinate on multimodal improvements in the study area, can help reduce employee and visitor VMT and support multimodal connectivity.

According to the California Air Pollution Control Officers Association (CAPCOA) *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*

(December 2021),[2] the maximum VMT reductions for various categories of on- and off-site measures range from approximately 2% to 65% for projects located in urban areas. However, given the magnitude of VMT that would need to be reduced due to visitor trips being 196% longer than average regional recreation trips, Mitigation Measure #1 may be insufficient to reduce VMT to less-than-significant levels.

Therefore, with the implementation of Mitigation Measure #1, the impact related to causing substantial vehicle miles traveled would remain **significant and unavoidable** after mitigation. In addition, the cumulative impact related to causing substantial vehicle miles traveled would remain **significant and unavoidable** after mitigation.

THRESHOLD T-3

Under Threshold T-3 (Substantially Increasing Hazards Due to a Geometric Design Feature or Incompatible Use), proposed projects should be analyzed to assess whether they would potentially increase hazards due to design features that impact safety, operations, or capacity during permanent conditions or temporary conditions during project construction. If a potential hazard impact is identified, measures should be identified to eliminate the potential hazards.

The City has prepared screening criteria to identify whether the project should be analyzed for potential impact from increasing hazards. The methodology and impact criteria to analyze the project's potential hazard impacts are summarized in this section.

SCREENING

If the proposed project requires a discretionary action, and the answer is yes to at least one of the screening questions below, then further analysis is required to assess whether the project would result in impacts due to geometric design hazards or incompatible uses.

- Is the project proposing new driveways, or introducing new vehicle access to the property from the public right-of-way?
- Is the project proposing to make any voluntary or required modifications to the public right-of-way (i.e., streets dedications, reconfigurations of curb line, etc.)?

The proposed project requires a discretionary action. In addition, as detailed in the "Project Description" section of this report, the project proposes a new driveway on 6th Street and realignment of the curb on Curson Avenue.

Therefore, this project cannot be screened out potential impacts to hazards under Threshold T-3.

IMPACT CRITERIA AND METHODOLOGY

Impact Threshold T-3 is as follows:

- **Threshold T-3**: Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The determination of significance shall consider the following factors:

- The relative amount of pedestrian activity at project access points.
- Design features/physical configurations that affect the visibility of pedestrians and bicyclists to drivers entering and exiting the site, and the visibility of cars to pedestrians and bicyclists.
- The type of bicycle facilities the project driveway(s) crosses and the relative level of utilization.

[2] https://www.caleemod.com/handbook/index.html

- The physical conditions of the site and surrounding area, such as curves, slopes, walks, landscaping or other barriers, that could result in vehicle/pedestrian, vehicle/bicycle, or vehicle/vehicle safety hazards.
- The project location, or project-related changes to the public right-of-way, relative to proximity to the High Injury Network or a Safe Routes to School program area.
- Any other conditions, including the approximate location of incompatible uses that would substantially increase a transportation hazard.

IMPACT ANALYSIS

The proposed project includes a new driveway on 6th Street that is 20 feet wide and consists of one inbound and one outbound lane. The driveway would be located approximately 450 feet west of the intersection with Curson Avenue and 250 east of the signalized pedestrian crossing. The driveway location does not result in exceeding 1 driveway per every 200 feet along the Avenue II frontage, locating it within 150 feet of the intersecting street, or locating it near a mid-block crosswalk.

6th Street has relatively flat grades and there are no visible obstructions to sight distance for the proposed location. 6th Street has an existing two-way left-turn lane for approximately 200 feet in each direction of the proposed driveway, with only one driveway on the north side which provides access to parking for the Park La Brea apartments. To minimize potential conflicts, the proposed project driveway will be aligned across from the existing driveway on the north side of 6th Street.

Pedestrian activity is high on 6th Street and there is a sidewalk with landscaped separation between the curb where the driveway would be located. Bicycle activity is moderate on 6th Street and currently share the roadway with vehicles but there are planned protected bike lanes. Introduction of a new driveway would create a new conflict point between vehicles and pedestrians/bicyclists, but will be designed to provide adequate sight distance and with curb radii that require slower speeds to complete turning movements.

A new loading zone is proposed along 6th Street between the LACMA parking access and the signalized mid-block crossing connecting to the site. The loading zone would replace existing on-street parking, and would operate similar to the existing parking when reviewing potential impact to hazards.

The project also includes modifying the curb along Curson Avenue to provide a pull-out area for loading and unloading. The project proposes to modify the curb line to create a bay for a section of curb that is already designated as a bus zone. This moves loading/unloading out of the travel lanes to separate it from the adjacent travel lane.

Based on the proposed site plan and evaluation of geometric design and uses, the proposed project would result in a **less than significant impact** when considering increasing hazards.

CUMULATIVE IMPACT ANALYSIS

The analysis of potential increased hazards was reviewed to determine if cumulative impacts may result from the proposed project in combination with related projects in the study area. Related projects in the area would likely contribute additional vehicle, pedestrian, and bicycle activity. The project design would not be impacted by the related projects nor the increase in activity.

The proposed project would result in a **less than significant cumulative impact** when considering increasing hazards based on the geometric design and uses of the proposed project.

MITIGATION

No mitigation measures are needed to address potential hazards for the proposed project.

Section 5 — Non-CEQA Analysis

NON-CEQA TRANSPORTATION ANALYSIS

This chapter details the non-CEQA transportation analysis of potential deficiencies in the transportation network resulting from the proposed project, based on evaluation criteria and methodologies from Section 3 of the City's TAG. Potential deficiencies were assessed under the following categories:

- Pedestrian, Bicycle, and Transit Access Assessment
- Project Access Safety and Circulation Evaluation
- Project Construction
- Residential Street Cut-Through Analysis

In addition, this chapter includes an assessment of special events and potential effects on the multimodal transportation network.

PEDESTRIAN, BICYCLE, AND TRANSIT ACCESS ASSESSMENT

According to the City's TAG, development projects may be required to conduct an assessment of potential effects on pedestrian, bicycle, and transit facilities in the vicinity of the proposed project. The deficiencies could be physical (through removal, modification, or degradation of facilities) or demand-based (by adding pedestrian or bicycle demand to inadequate facilities).

SCREENING

If a proposed project answers yes to all of the following questions, further analysis will be required to assess whether the project would negatively affect pedestrian, bicycle, or transit facilities.

- Does the land use project involve a discretionary action that would be under review by the Department of City Planning?
- Does the land use project include the construction, or addition of: 50 (or more) dwelling units or guest rooms or combination thereof, or 50,000 square feet (or more) of non-residential space?
- Would the project generate a net increase of 1,000 or more daily vehicle trips, or is the project's frontage along an Avenue, Boulevard, or Collector (as designated in the City's General Plan) 250 linear feet or more, or is the project's building frontage encompassing an entire block along an Avenue or Boulevard (as designated in the City's General Plan)?

The proposed project involves a discretionary action, and will generate more than 1,000 net new daily vehicle trips. However, the proposed project includes the construction of less than 50,000 square feet of new non-residential space. Therefore, the proposed project is not required to undergo a pedestrian, bicycle, and transit access assessment.

However, a pedestrian, bicycle, and transit access assessment has been conducted for the proposed project to ensure that potential deficiencies are disclosed.

EVALUATION CRITERIA AND METHODOLOGY

The City's TAG provide the following factors to consider when assessing a project's potential effect on pedestrian, bicycle and transit facilities:

- Would a project directly or indirectly result in a permanent removal or modification that would lead to the degradation of pedestrian, bicycle, or transit facilities, including but not limited to:
  - Removal or degradation of existing bikeways and/or supporting facilities (e.g., bikeshare stations, on-street bike racks/parking, bike corrals, etc.)
  - Removal or degradation of existing transit and/or local circulator facilities including stop, bench, shelter, concrete pad, bus lane, or other amenities
  - Removal of other existing transportation system elements supporting sustainable mobility
  - Increase street crossing distance for pedestrians; increase in number of travel/turning lanes; increase in turning radius or turning speeds
  - Removal, degradation, or narrowing of an existing sidewalk, path, crossing, or pedestrian access way
  - Removal or narrowing of existing sidewalk-street buffering elements (e.g., curb extension, parkway, planting strip, street trees, etc.)
- Would a project intensify use of existing pedestrian, bicycle, or transit facilities, including but not limited to:
  - Increase in pedestrian or vehicle volume, and thereby increase the need or attraction to cross a street at unmarked pedestrian crossings or unsignalized or uncontrolled intersections where a crossing is not available without significant rerouting.
  - Result in new pedestrian demand between project site entries/exits and major destinations or transit stops expected to serve the development where there are missing pedestrian facilities (e.g., gaps in the sidewalk network) or substandard pedestrian facilities (e.g., narrow or uneven sidewalks, no crosswalks at intersections or mid-block, no marked crossing, or push button crossing rather than actuated, etc.).
  - Increase transit demand at bus stops that lack marked crossings, with insufficient sidewalks, or are in isolated, unshaded, or unlit areas.

ASSESSMENT

The proposed project would not directly or indirectly result in a permanent removal or modification that would lead to the degradation of pedestrian, bicycle, or transit facilities. No changes are proposed to existing bikeways and transit stops. In addition, no changes are proposed that would remove pedestrian facilities, increase pedestrian crossing distances, or increase vehicle turning speeds.

The proposed project may intensify use of existing pedestrian and transit facilities along Wilshire Boulevard between Curson Avenue and Spaulding Avenue. As shown in Table 5, the project is estimated to generate 66 net new visitor walking trips during the weekday midday peak hour, 16 net new visitor walking trips during the weekday PM peak hour, and 60 net new visitor walking trip during the Saturday midday peak hour. In addition, as shown in Table 3, the project is estimated to generate 78 net new visitor transit trips during the weekday midday peak hour, 18 net new visitor transit trips during the weekday PM peak hour, and 73 net new visitor transit trip during the Saturday midday peak hour; these transit trips will also include walk-to-transit trips.

As shown in Table 14 through Table 17, there is currently substantial pedestrian demand at the Spaulding Avenue/Wilshire Boulevard and Curson Avenue/Wilshire Boulevard intersections during the peak periods. For example, 200 pedestrians utilize the crosswalk at the southern Spaulding Avenue/Wilshire Boulevard leg during the weekday midday (12:00 PM to 2:00 PM) peak period; 245 pedestrians utilize the northern crosswalk and 186 pedestrians utilize the western crosswalk at the Curson Avenue/Wilshire Boulevard intersection. The proposed project would increase pedestrian demand at these two intersections, including people walking to local bus stops.

While continental crosswalks are provided at all three legs at the Spaulding Avenue/Wilshire Boulevard intersection, three of the four curb ramps are not ADA ramps and lack high-visibility truncated domes. In addition, while the southern leg's crosswalk has fixed pedestrian timing, the north-south crosswalks have push buttons.

At the Curson Avenue/Wilshire Boulevard intersection, all four crosswalks are standard rather than continental crosswalks. Three of the four curb ramps are not ADA ramps and lack high-visibility truncated domes. While east-west crosswalks across Curson Avenue have fixed pedestrian timing, the north-south crosswalks across Wilshire Boulevard have push buttons. In addition, the Curson Avenue frontage road approximately 60 feet east of the Curson Avenue/Wilshire Boulevard intersection has two curb ramps, but they lack high-visibility truncated domes; no marked crosswalk is provided.

Of the two bus stops each at the Curson Avenue/Wilshire Boulevard and Spaulding Avenue/Wilshire Boulevard intersections, only the bus stop on the north side of Wilshire Boulevard west of the Curson Avenue intersection has a shelter. The remaining three bus stops lack shelters and are unshaded.

In addition, it should be noted that Wilshire Boulevard (east of Fairfax Avenue) is on the City's Vision Zero High-Injury Network.

RECOMMENDED IMPROVEMENTS

In order to improve pedestrian and transit access in the study area, the project should coordinate with the City of Los Angeles to explore the feasibility of implementing the following improvements:

- Continental crosswalks at the Curson Avenue/Wilshire Boulevard intersection and frontage road crossing directly to the east of the intersection;
- High-visibility curb ramps with truncated domes at the Spaulding Avenue/Wilshire Boulevard intersection, Curson Avenue/Wilshire Boulevard intersection, and frontage road crossing directly to the east of the Curson Avenue/Wilshire Boulevard intersection; and
- Pedestrian recall timing (as opposed to pedestrian push buttons) for the north-south crosswalks at the Curson Avenue/Wilshire Boulevard and Spaulding Avenue/Wilshire Boulevard intersections.

In order to improve transit access in the study area, the project should coordinate with the City of Los Angeles and LA Metro to install shelters at the two Spaulding Avenue/Wilshire Boulevard stops and one Curson Avenue/Wilshire Boulevard stop that currently lack them.

PROJECT ACCESS SAFETY AND CIRCULATION EVALUATION

According to the City's TAG, development projects may be required to conduct an assessment of project access and circulation constraints related to the provision of access to and from the project site, and may include operational or capacity constraints. Constraints can be related to vehicular/vehicular, vehicular/bicycle, and vehicular/pedestrian constraints as well as operational delays.

SCREENING

If a proposed project answers yes to all of the following questions, further analysis will be required to assess whether the project would negatively affect project access and circulation.

- Does the land use project involve a discretionary action that would be under review by the Department of City Planning?
- Would the land use project generate a net increase of 250 or more daily vehicle trips?

The project involves a discretionary action and generates more than 250 net new daily vehicle trips. Therefore, an access and circulation assessment is required.

EVALUATION CRITERIA AND METHODOLOGY

This assessment will include a quantitative evaluation of expected access and circulation operations. Project access is considered constrained if the project's traffic would contribute to unacceptable queuing on an Avenue or Boulevard or at project driveways, or would cause or substantially extend queuing at nearby signalized intersections. Unacceptable or extended queuing may be defined as follows:

- Spill over from turn pockets into through lanes.
- Block cross streets or alleys.
- Contribute to "gridlock" congestion, where traffic queues between closely-spaced intersections impede the flow of traffic through upstream intersections.

A delay and queuing assessment of study intersections and project driveways were conducted for the Opening Year (2032) and Opening Year Plus Project conditions, utilizing the Highway Capacity Manual methodology and Vistro transportation software.

In addition, this assessment will characterize the on-site loading demand of the project frontage and answer these questions:

- Would the project result in passenger loading demand that could not be accommodated within any proposed on-site passenger loading facility?
- Would accommodating the passenger loading demand create pedestrian or bicycle conflicts?
- Which curbside management options should be explored to better address passenger loading needs in the public right-of-way?

ASSESSMENT

Opening Year Traffic Volumes

Opening Year (2032) Without Project intersection volume forecasts were developed by applying an ambient growth factor of 1% per year to the existing traffic volumes provided in Figure 8 through Figure 11. In addition, Opening Year (2032) Without Project forecast include trips generated by related projects in the study area, as detailed in Table 18. Related project peak hour trips were distributed to the roadway network and assigned to study intersections based on information from the relevant project transportation studies or memos (if available) or based on a review of the related project locations and local travel patterns. Related project peak hour trip assignment is shown in Figure 13 through Figure 16. Opening Year peak hour intersection volumes (combining existing counts, ambient growth, and related project trips) are shown in Figure 17 through Figure 20.

Figure 13: Related Project-Only Weekday AM Peak Hour Traffic Volumes

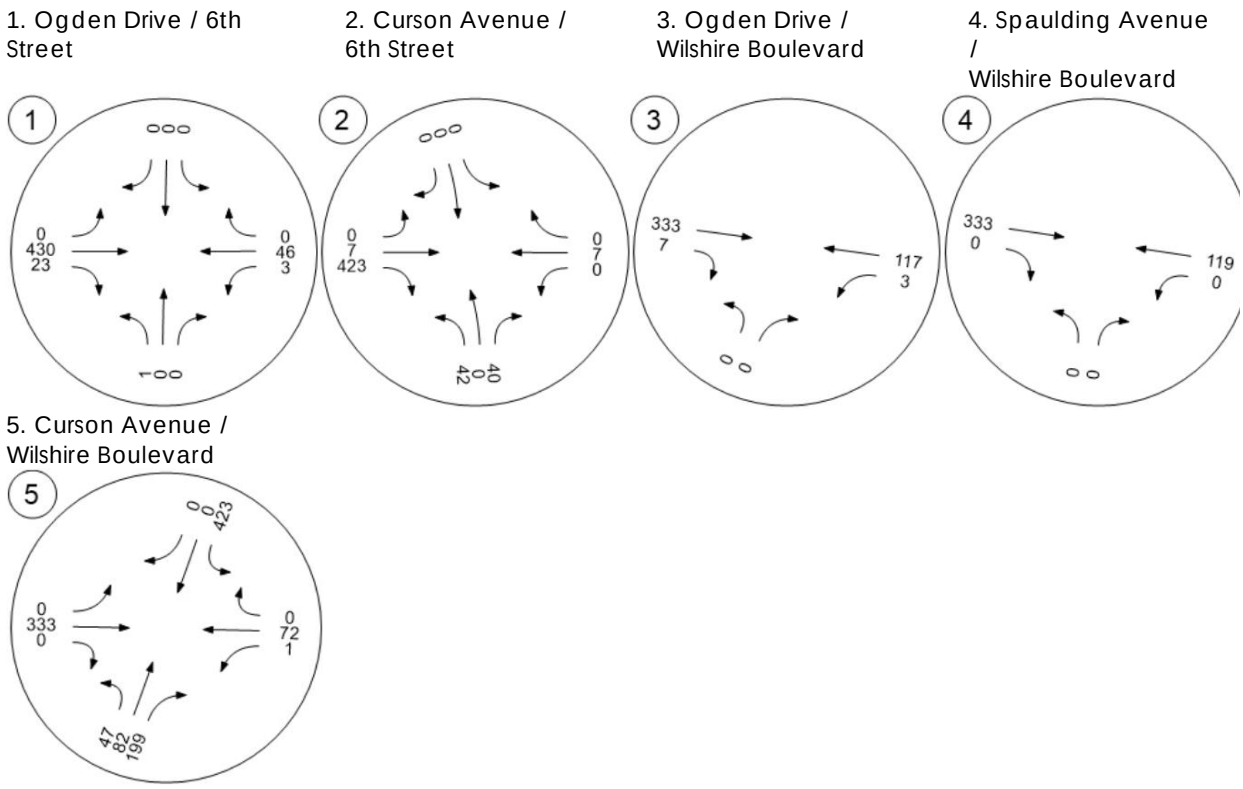


Figure 14: Related Project-Only Weekday Midday Peak Hour Traffic Volumes

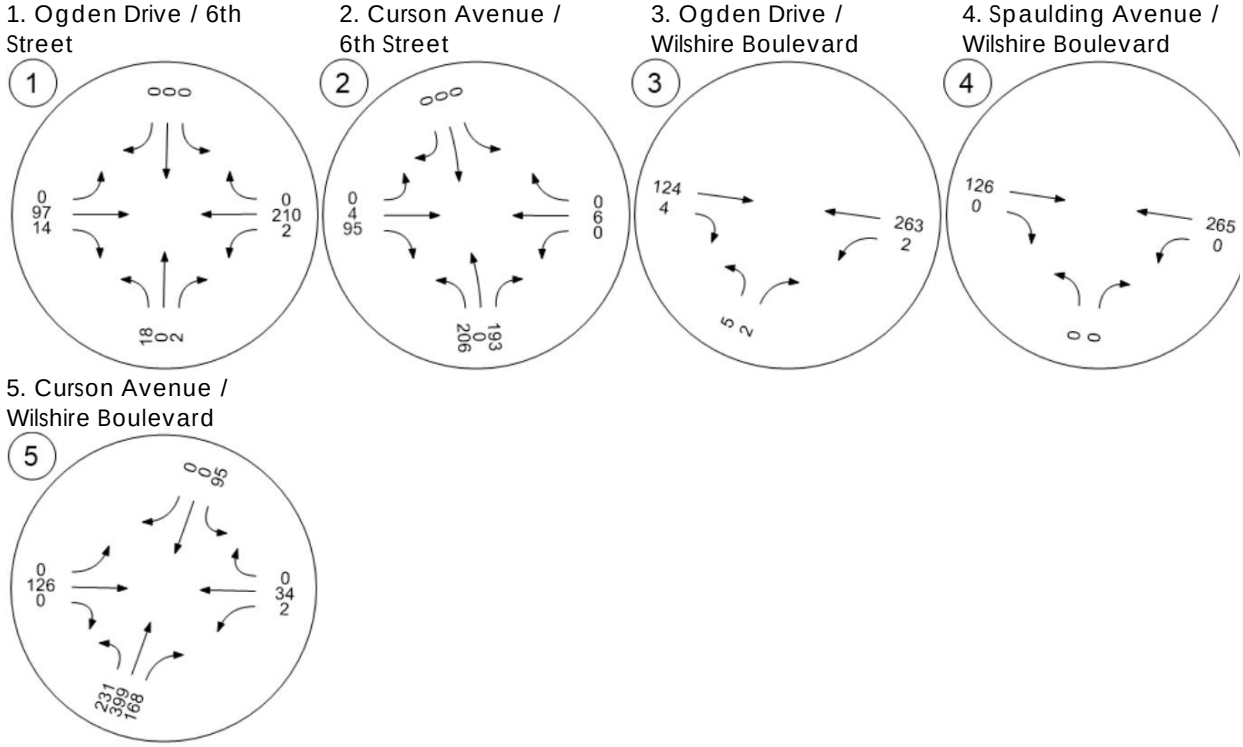


Figure 15: Related Project-Only Weekday PM Peak Hour Traffic Volumes

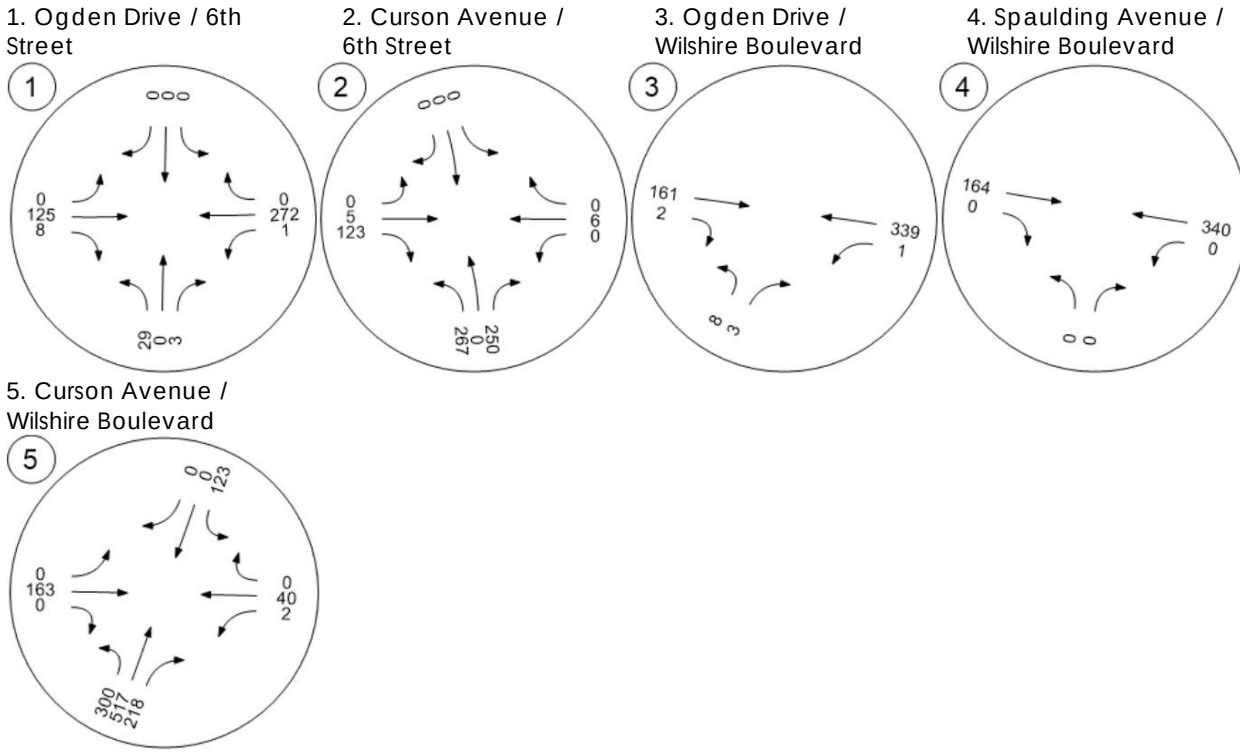


Figure 16: Related Project-Only Saturday Midday Peak Hour Traffic Volumes

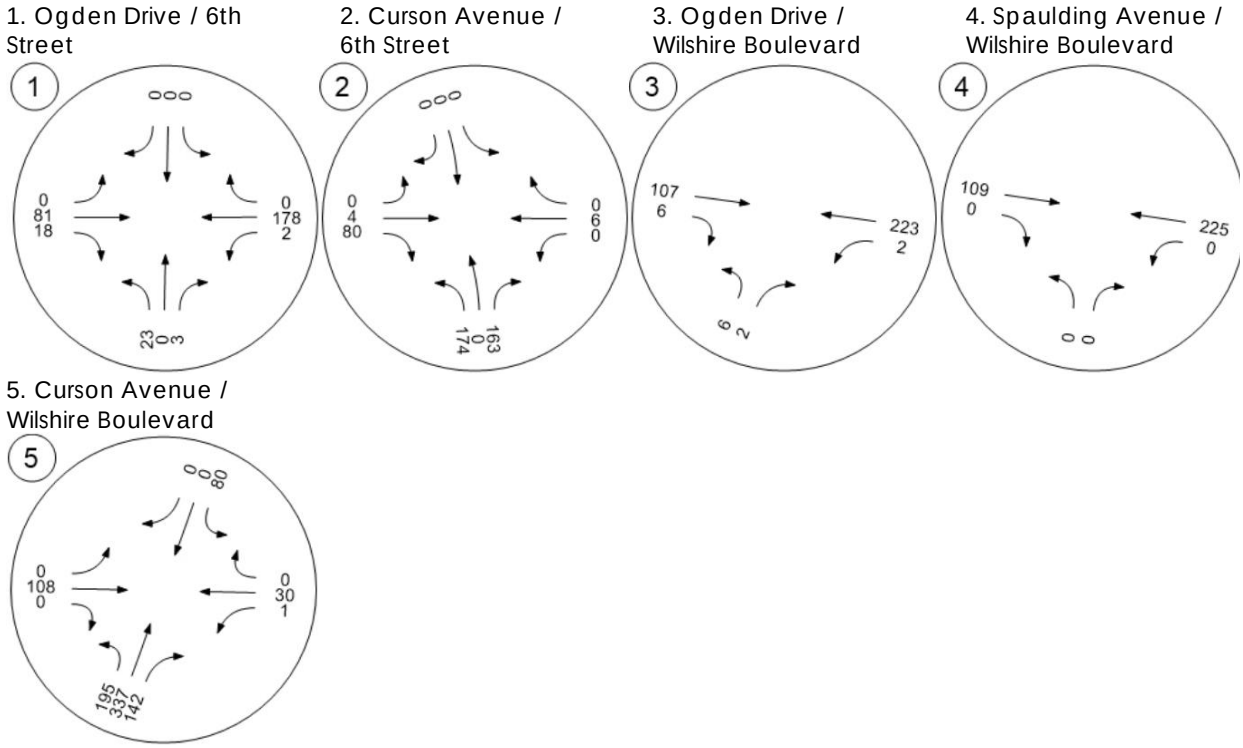


Figure 17: Opening Year (2032) Without Project Weekday AM Peak Hour Traffic Volumes

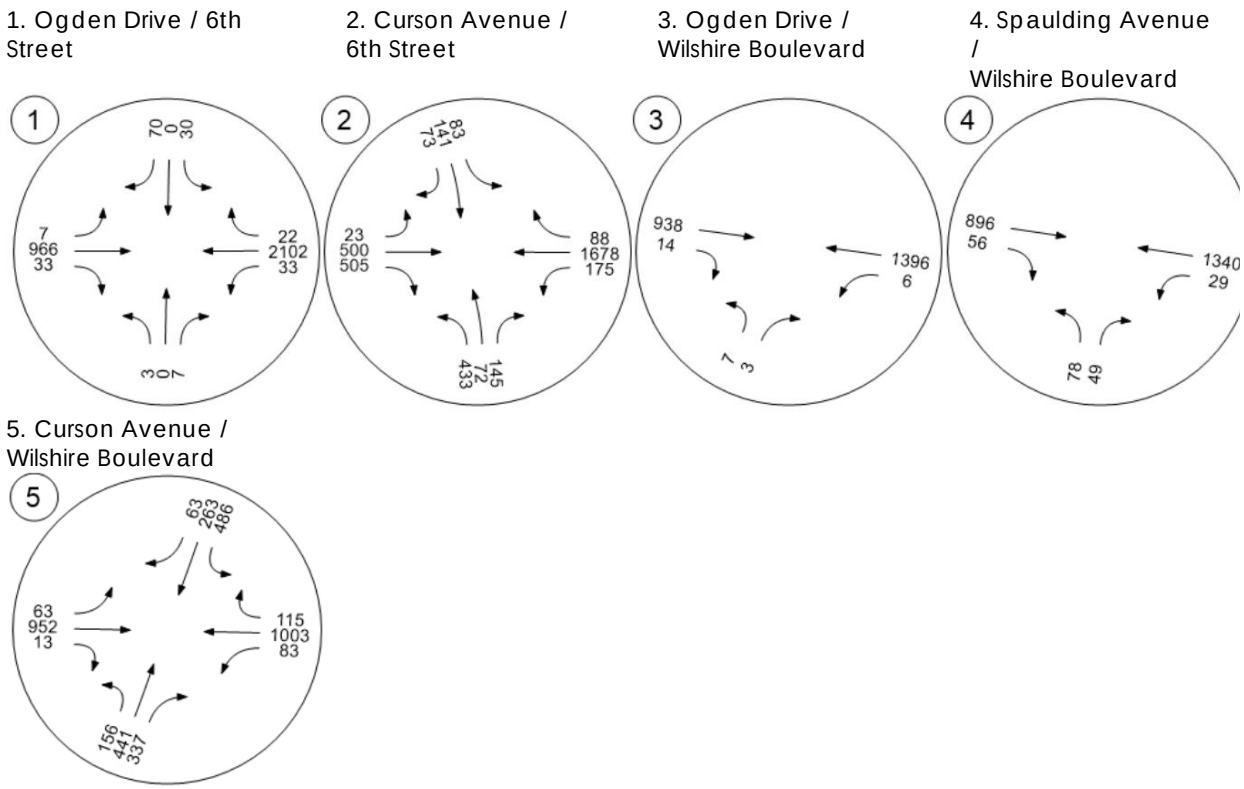


Figure 18: Opening Year (2032) Without Project Weekday Midday Peak Hour Traffic Volumes

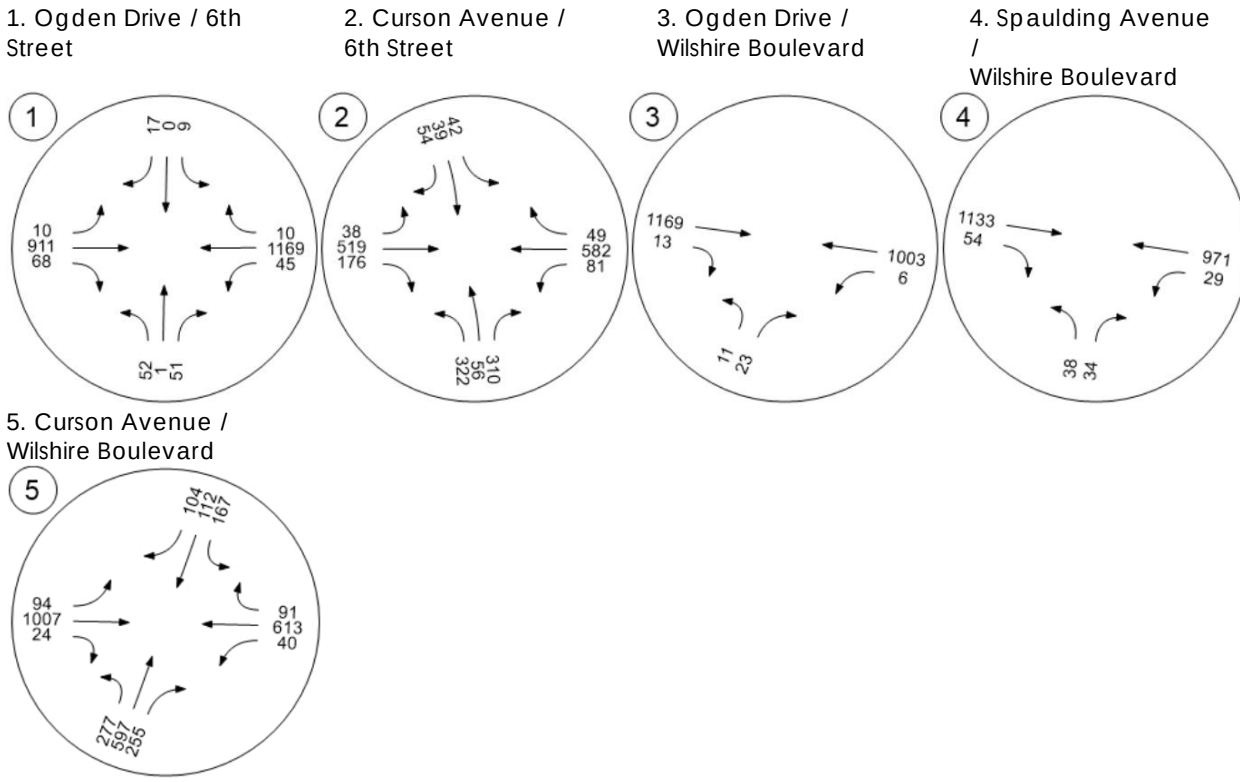


Figure 19: Opening Year (2032) Without Project Weekday PM Peak Hour Traffic Volumes

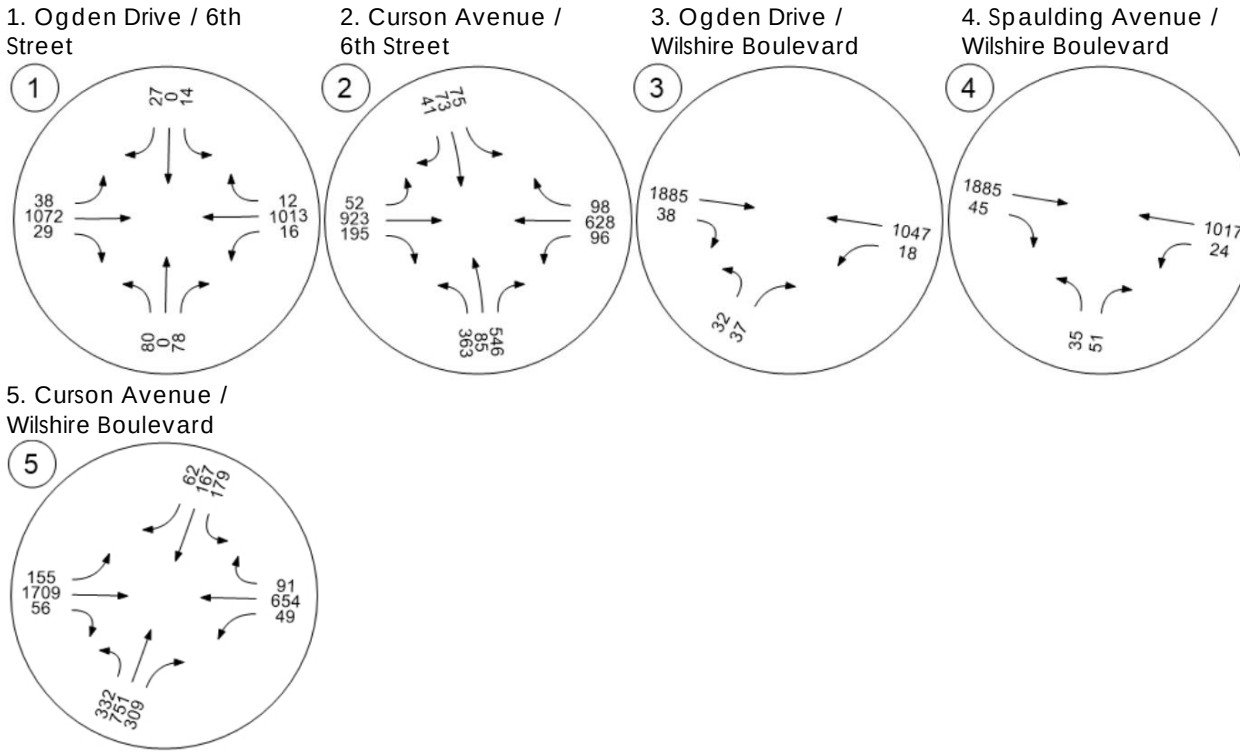
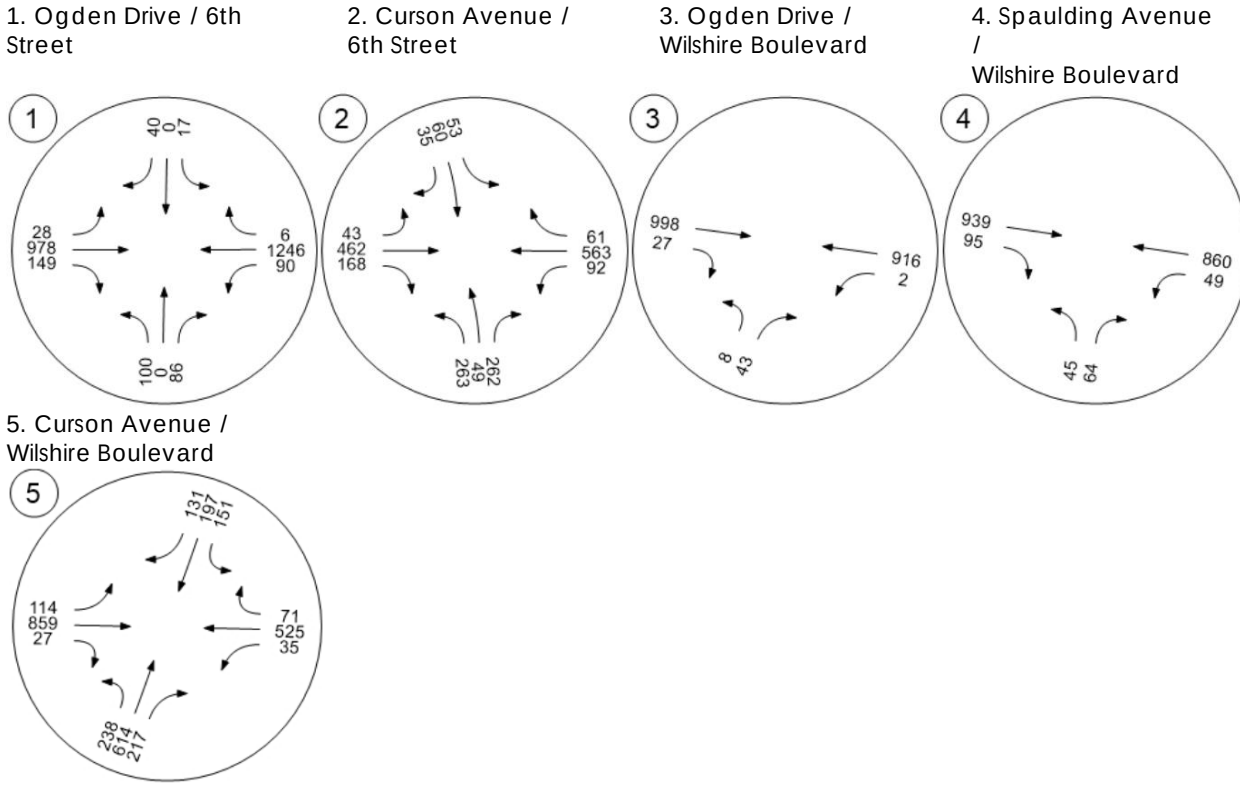


Figure 20: Opening Year (2032) Without Project Saturday Midday Peak Hour Traffic Volumes



Opening Year With Project intersection volumes were developed by adding net new peak hour vehicle trips generated by the project (Table 6). The project trip distribution percentages were based on the surrounding roadway network and land uses, consistent with the distribution used in the LACMA Renovation traffic study:

- 35% to/from the south via Fairfax Avenue
- 22% to/from the west via Wilshire Boulevard
- 3% to/from the west via 6th Street
- 15% to/from the north via Fairfax Avenue
- 6% to/from the east via 6th Street
- 15% to/from the east via Wilshire Boulevard
- 4% to/from the south via Curson Avenue

The net new project trips were then assigned to study area intersections and project driveways. The project site will include a parking lot with two access points: one access point along 6th Street (west of Curson Avenue) and one access point along Curson Avenue (south of 6th Street). An increase in the on-site parking supply is not anticipated. In addition, there are several other parking structures in the vicinity of the project site:

- LACMA (entry/exit at the Ogden Drive/6th Street intersection)
- SAG (entry and exit on Curson Avenue)
- Wilshire Courtyard (entry on Courtyard Place, exit on Curson Avenue)
- Petersen Automotive Museum (entry on Fairfax Avenue, exit on Orange Grove Avenue)
- Future Purple Line parking garage (under construction and not included as part of the vehicle trip assignment)

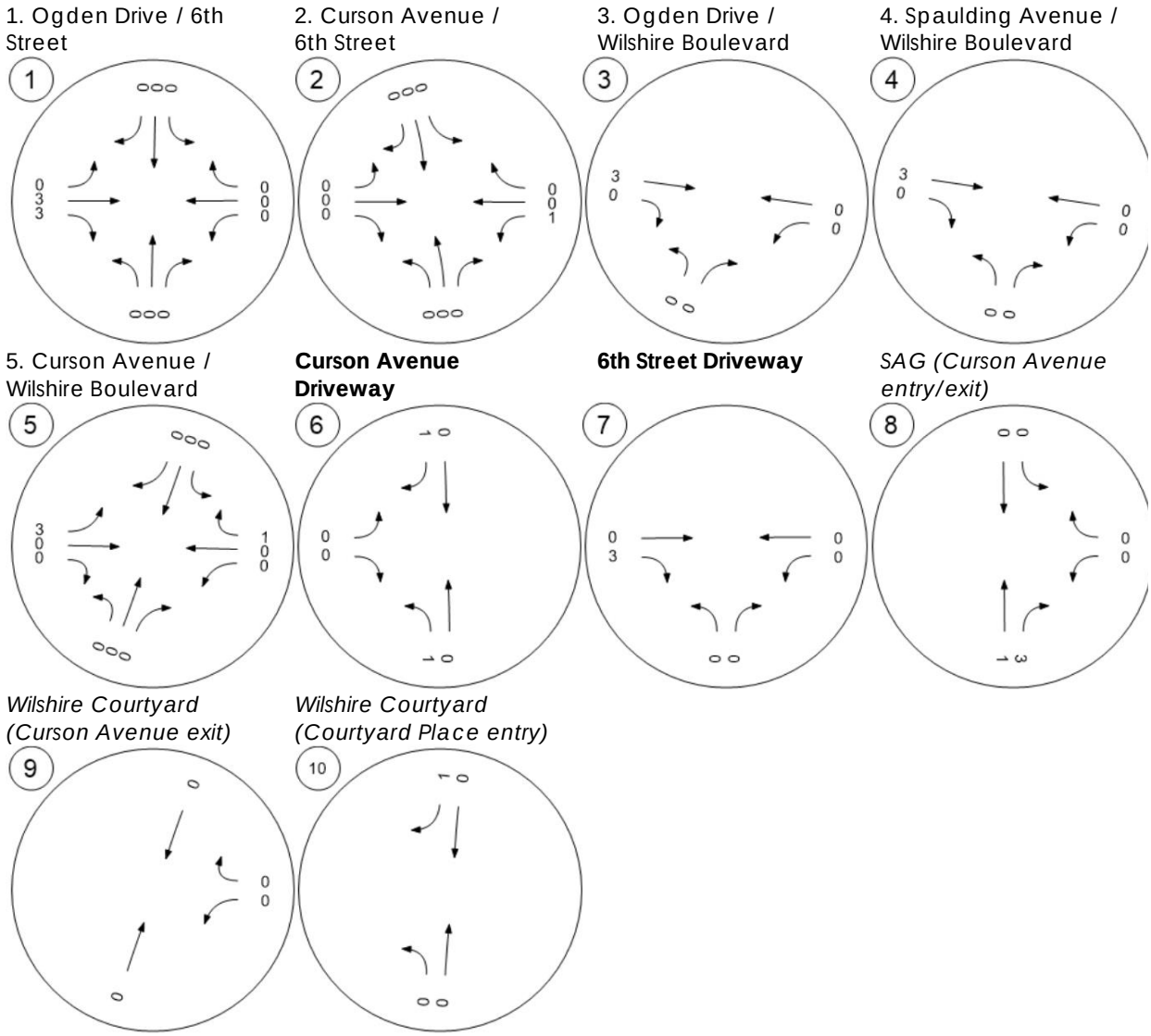
According to a 2019 study,[3] ride-hailing services such as Uber and Lyft account for approximately 3% of trips in Los Angeles. Given that the proposed project will include two passenger drop-off locations (within the parking lot and curbside along 6th Street) and the increased popularity of transportation network company services, it is assumed that a higher percentage (10%) of the project's vehicle trips will consist of ride-hailing trips that utilize the on-site passenger loading zones. Of the remaining 90% of vehicle trips, the parking location assignment assumptions are as follows:

- Project's on-site parking: 30%
- LACMA: 25%
- SAG: 25%
- Wilshire Courtyard: 10%

The project-only trip assignment for the weekday AM, weekday midday, weekday PM, and Saturday midday peak hours are shown in Figure 21 through Figure 24, which include net new trip assignment at project driveways and nearby off-site parking garage driveways. The Opening Year With Project peak hour intersection volumes (combining Opening Year No Project forecasts and the project-only trips) are shown in Figure 25 through Figure 28.

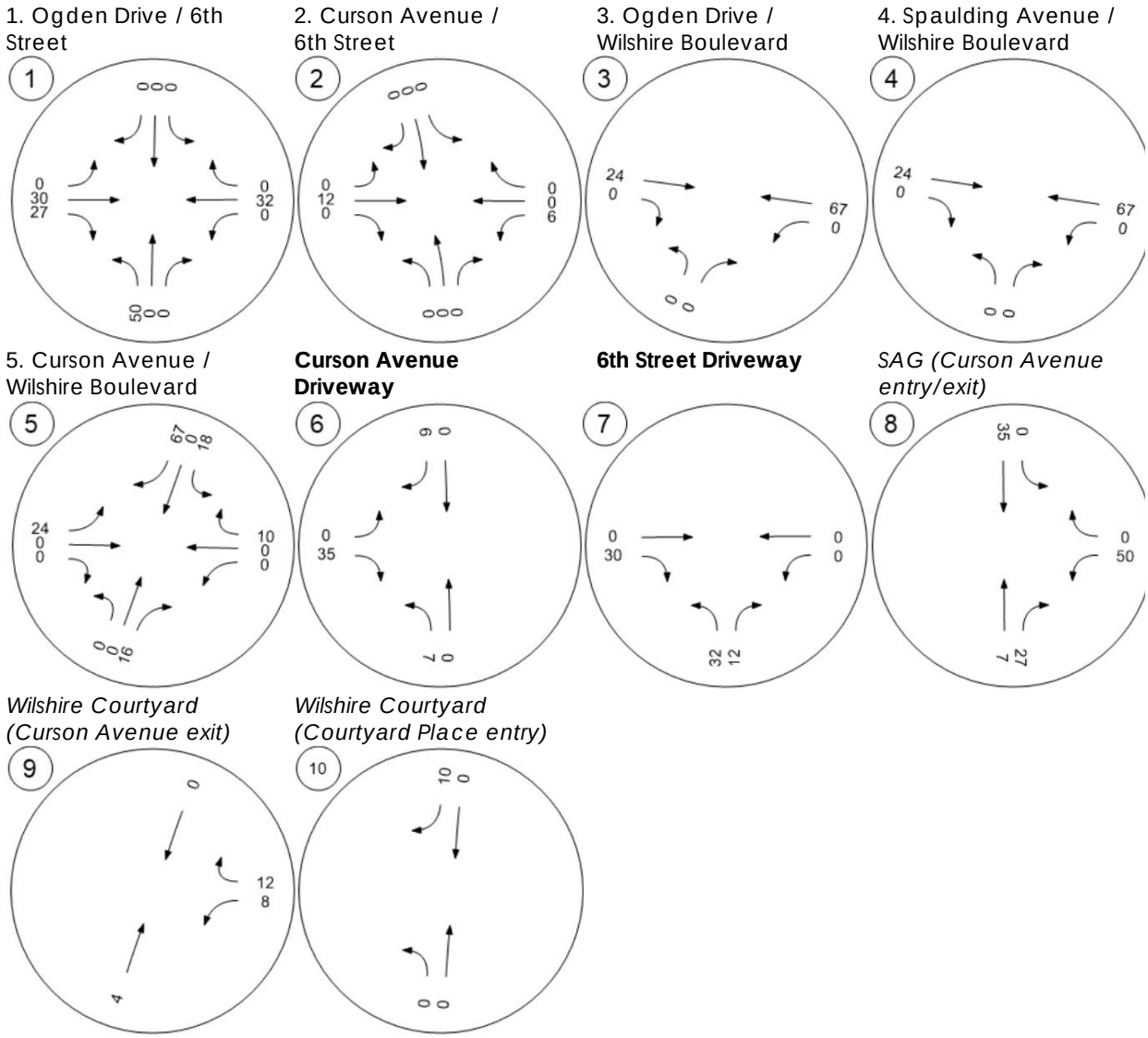
[3] https://www.fehrandpeers.com/what-are-tncs-share-of-vmt/

Figure 21: Project-Only Weekday AM Peak Hour Traffic Volumes



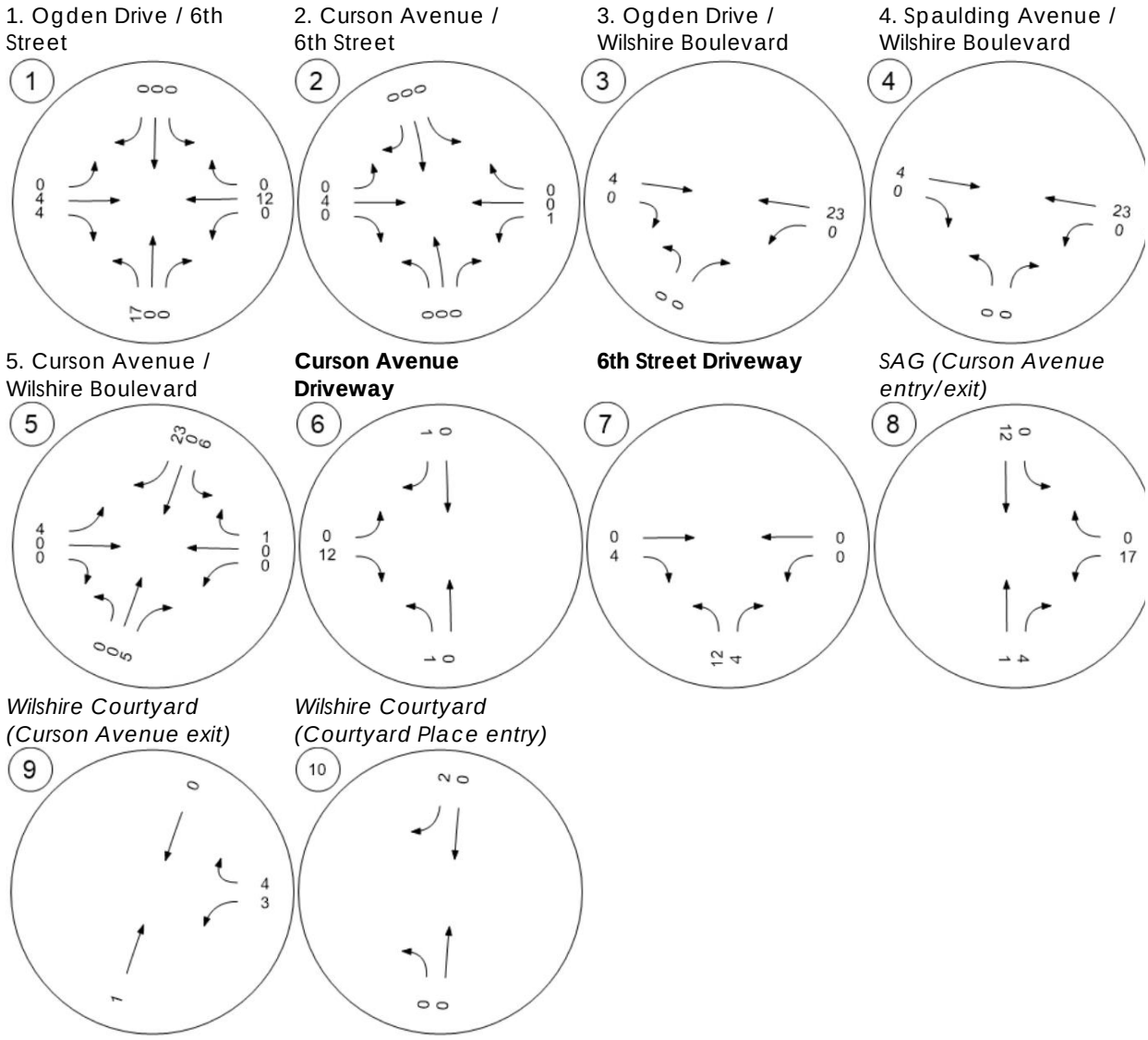
Notes:
Locations #1 through #5 are study intersections.
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.

Figure 22: Project-Only Weekday Midday Peak Hour Traffic Volumes



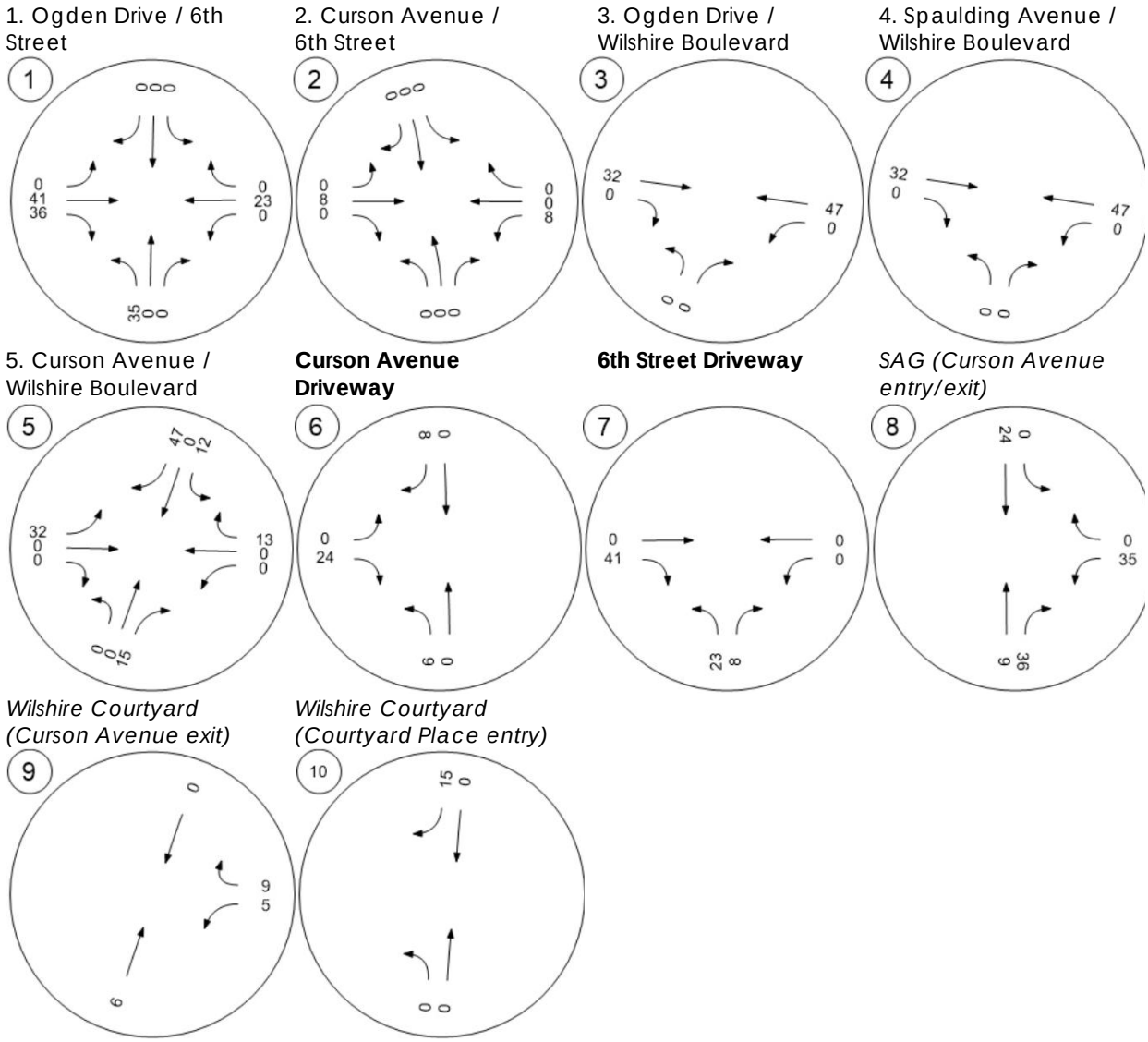
Notes:
Locations #1 through #5 are study intersections.
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.

Figure 23: Project-Only Weekday PM Peak Hour Traffic Volumes



Notes:
Locations #1 through #5 are study intersections.
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.

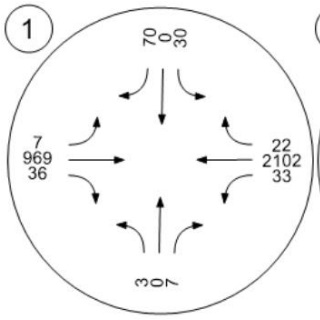
Figure 24: Project-Only Saturday Midday Peak Hour Traffic Volumes



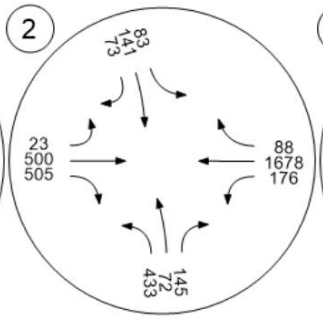
Notes:
Locations #1 through #5 are study intersections.
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.

Figure 25: Opening Year (2032) With Project Weekday AM Peak Hour Traffic Volumes

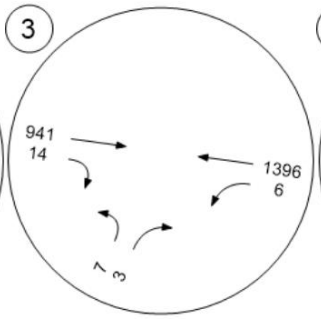
1. Ogden Drive / 6th Street



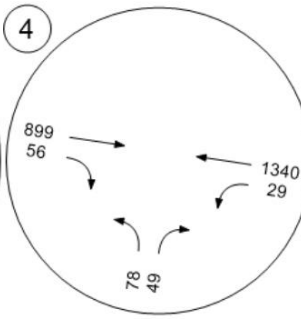
2. Curson Avenue / 6th Street



3. Ogden Drive / Wilshire Boulevard



4. Spaulding Avenue / Wilshire Boulevard



5. Curson Avenue / Wilshire Boulevard

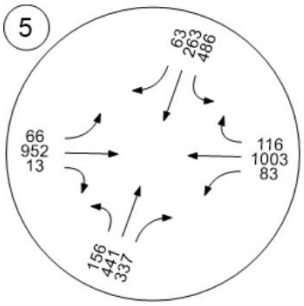
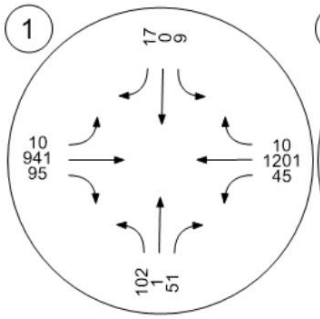
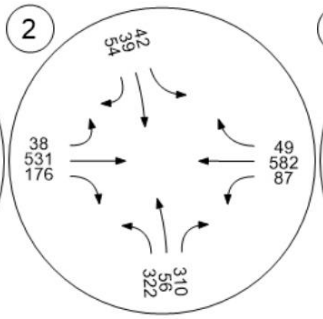


Figure 26: Opening Year (2032) With Project Weekday Midday Peak Hour Traffic Volumes

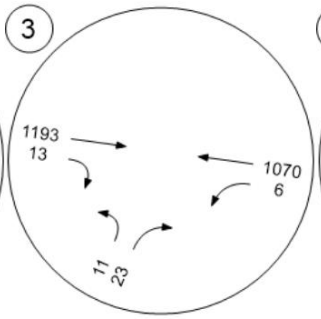
1. Ogden Drive / 6th Street



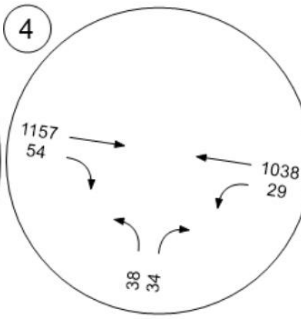
2. Curson Avenue / 6th Street



3. Ogden Drive / Wilshire Boulevard



4. Spaulding Avenue / Wilshire Boulevard



5. Curson Avenue / Wilshire Boulevard

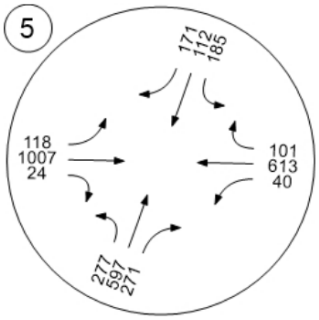


Figure 27: Opening Year (2032) With Project Weekday PM Peak Hour Traffic Volumes

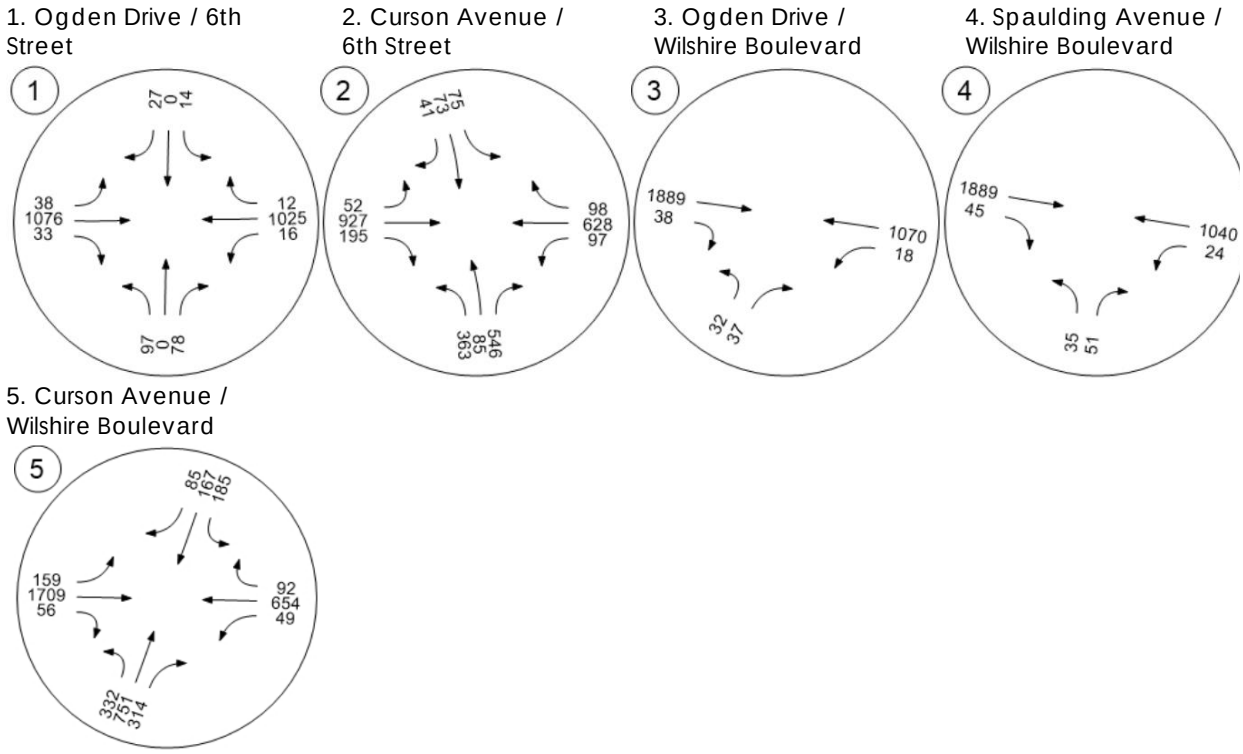
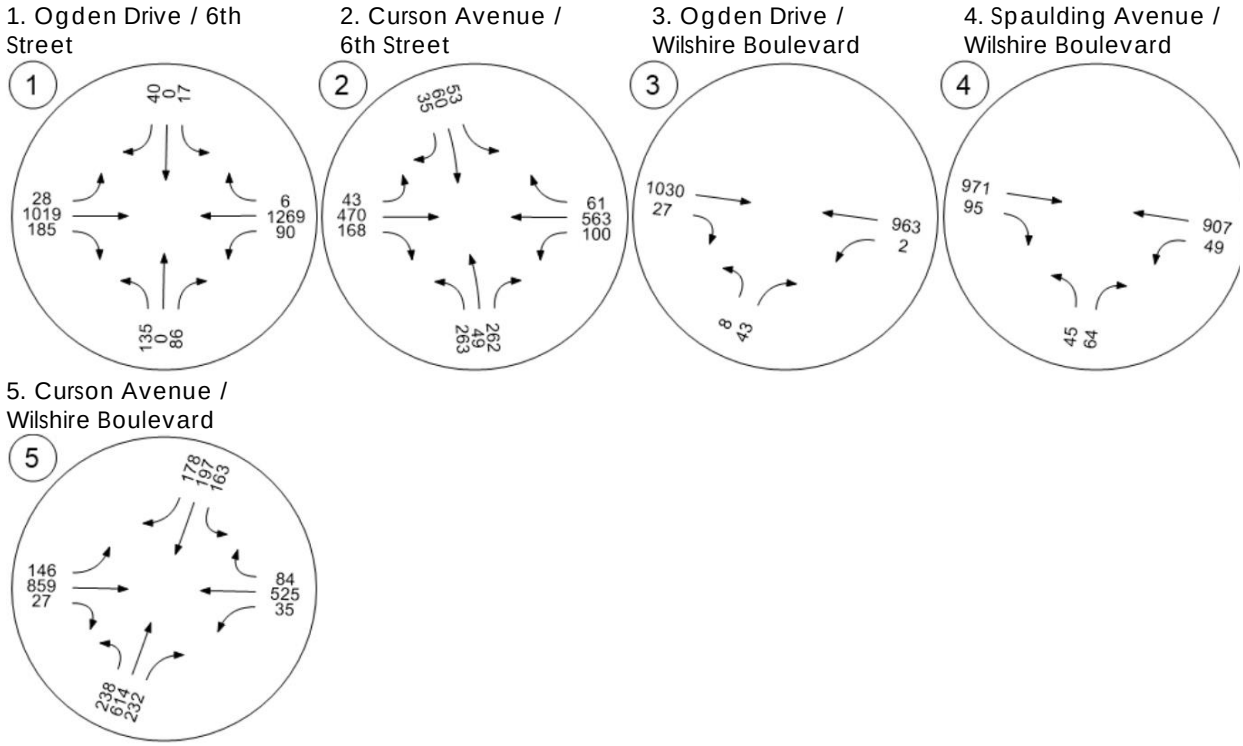


Figure 28: Opening Year (2032) With Project Saturday Midday Peak Hour Traffic Volumes



LOS and Queuing

Opening Year Without Project and With Project intersection LOS are shown in Table 20. LOS E and LOS F operations are highlighted in yellow. As shown in the table, the addition of project trips causes the Curson Avenue/6th Street intersection to drop from LOS D to LOS E during the weekday PM peak hour, although the addition of project trips is projected to increase delay by only 0.6 seconds. The project is expected to contribute to increased delay at the Curson Avenue/Wilshire Boulevard intersection, which operates at LOS F during the weekday midday, weekday PM, and Saturday midday peak hours. The Curson Avenue/Wilshire Boulevard intersection is utilized by multiple bus routes that run along Wilshire Boulevard; the Wilshire Boulevard bus-only lanes are utilized as on-street parking outside the weekend morning and evening peak periods.

Project driveway delay and LOS is shown in Table 21. Note, in addition to net new vehicle trips generated by the expanded Museum, the driveways include additional volume to account for existing site trips. As shown in the table, the northbound exiting approach from the 6th Street driveway is expected to experience LOS E conditions. This is primarily due to higher east-west traffic along 6th Street during the weekday morning and evening commute periods. While the project is not open to visitors during the weekday AM peak hour, on-site delay during the weekday PM peak hour could result in vehicle-vehicle conflicts. However, this delay is limited to the project site and not to study area roadway facilities.

Table 20: Opening Year (2032) Intersection Level of Service

Intersection		Peak Hour	Opening Year		Opening Year With Project		
			Delay (sec)	LOS	Delay (sec)	LOS	Change
1	Ogden/6th	Weekday AM	8.3	A	8.3	A	0.0
		Weekday MD	8.5	A	10.2	B	1.8
		Weekday PM	11.3	B	12.3	B	0.9
		Saturday MD	11.3	B	14.0	B	2.7
2	Curson/6th	Weekday AM	59.0	E	59.0	E	0.0
		Weekday MD	16.3	B	16.4	B	0.2
		Weekday PM	54.7	D	55.3	E	0.6
		Saturday MD	14.3	B	14.4	B	0.1
3	Ogden/Wilshire	Weekday AM	2.2	A	2.2	A	0.0
		Weekday MD	3.3	A	3.3	A	0.0
		Weekday PM	5.8	A	5.8	A	0.0
		Saturday MD	3.9	A	3.9	A	0.0
4	Spaulding/ Wilshire	Weekday AM	7.2	A	7.2	A	0.0
		Weekday MD	5.5	A	5.5	A	0.0
		Weekday PM	8.3	A	8.3	A	0.0
		Saturday MD	8.6	A	8.7	A	0.1
5	Curson/Wilshire	Weekday AM	> 80.0	F	> 80.0	F	-0.2
		Weekday MD	> 80.0	F	> 80.0	F	22.1
		Weekday PM	> 80.0	F	> 80.0	F	7.3
		Saturday MD	> 80.0	F	> 80.0	F	15.2

SOURCE: KITTELSON & ASSOCIATES, 2022.

Table 21: Opening Year (2032) Project Driveway Level of Service

Driveway	Peak Hour	Delay (sec)	LOS
Curson Avenue Driveway	Weekday AM	22.7	C
	Weekday MD	17.2	C
	Weekday PM	18.0	C
	Saturday MD	15.2	C
6th Street Driveway	Weekday AM	49.3	E
	Weekday MD	26.3	D
	Weekday PM	44.2	E
	Saturday MD	22.0	C

SOURCE: KITTELSON & ASSOCIATES, 2022.

Opening Year Without Project and With Project study intersection queuing is shown in Table 22. Storage lengths for turning movements are based on the turn pocket length and excludes the taper. Storage lengths for through movements are measured to the nearest adjacent cross street or crosswalk. Queues that are projected to exceed storage are highlighted in yellow. As shown in the table, the addition of project trips is expected to cause multiple queues to exceed available storage, or increase queues that exceed storage under Without Project conditions:

- **Intersection #1 (Ogden Drive/6th Street):** The LACMA parking structure's northbound exiting queue would exceed the available storage on the exiting drive aisle. However, this queue would remain on-site within the parking structure.
- **Intersection #2 (Curson/6th Street):** The northbound left, southbound left, southbound through/right, eastbound right, and westbound through/right queues would exceed available storage; however, the project is not anticipated to increase these queues. In addition, the eastbound through and westbound left queues would exceed available storage; however, the project is expected to increase each queue by two car lengths or less during each peak hour.
- **Intersection #5 (Curson Avenue/Wilshire Boulevard):** The northbound, southbound, eastbound, and westbound queues are projected to exceed available storage; the project would substantially increase the northbound and southbound queues. The southbound queues may interfere with the crosswalks at the Curson Avenue/6th Street intersection. The northbound queues exceed the available storage, measured to the intersecting alley directly to the south. While there is additional storage that extends to the Curson Avenue/8th Street intersection, that storage is also exceeded, potentially conflicting with the crosswalks at that intersection.

Project driveway queues are shown in Table 23. Queues exiting the project driveways are not expected to exceed available storage. However, the length of the eastbound and northbound queues at the Curson Avenue/6th Street intersection and southbound queues at the Curson Avenue/Wilshire Boulevard are expected to interfere with accessing the project driveways and may interfere with driveway operations.

Table 22: Opening Year (2032) Intersection Queuing

Intersection		Movement		Storage (ft.)	Opening Year				Opening Year With Project			
					AM Queue (ft.)	MD Queue (ft.)	PM Queue (ft.)	Sat. Queue (ft.)	AM Queue (ft.)	MD Queue (ft.)	PM Queue (ft.)	Sat. Queue (ft.)
1	Ogden/6th	NB	Left/Thru/Right	70	< 25	63	167	114	< 25	93	184	134
		SB	Left/Thru/Right	205	104	< 25	39	32	104	< 25	38	31
		EB	Left	100	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
			Thru	555	233	250	450	320	234	302	485	405
			Right	60	< 25	< 25	< 25	25	< 25	< 25	< 25	37
		WB	Left	140	< 25	26	< 25	70	< 25	29	< 25	83
			Thru/Right	505	282	118	133	147	282	141	146	172
2	Curson/6th	NB	Left	110	591	201	236	153	591	201	236	153
			Thru/Right	790	94	191	704	156	94	191	704	156
		SB	Left	35	44	26	56	32	44	26	56	32
			Thru/Right	85	91	37	44	39	91	37	44	39
		EB	Left	100	< 25	< 25	29	< 25	< 25	< 25	29	< 25
			Thru	725	230	238	946	182	230	246	962	186
			Right	40	274	67	75	55	274	67	75	55
		WB	Left	95	183	56	129	52	185	62	132	57
			Thru/Right	575	892	129	152	110	892	129	152	110
3	Ogden/Wilshire	NB	Left	145	< 25	< 25	35	< 25	< 25	< 25	35	< 25
			Right	145	< 25	26	38	48	< 25	26	38	48
		EB	Thru	515	32	83	245	81	32	86	247	85
			Right	100	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
		WB	Left	115	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
			Thru	385	60	66	91	72	60	73	94	77
4	Spaulding/Wilshire	NB	Left/Right	570	139	78	90	105	139	78	90	105
		EB	Thru/Right	380	124	145	327	198	124	150	328	205
		WB	Left	65	< 25	< 25	< 25	30	< 25	< 25	< 25	30
			Thru	500	199	103	116	149	199	113	120	160

Intersection		Movement		Storage (ft.)	Opening Year				Opening Year With Project			
					AM Queue (ft.)	MD Queue (ft.)	PM Queue (ft.)	Sat. Queue (ft.)	AM Queue (ft.)	MD Queue (ft.)	PM Queue (ft.)	Sat. Queue (ft.)
5	Curson/Wilshire	NB	Left/Thru/Right	100	> 1,000	> 1,000	> 1,000	> 1,000	> 1,000	> 1,000	> 1,000	> 1,000
		SB	Left/Thru/Right	790	> 1,000	506	618	814	> 1,000	838	740	> 1,000
		EB	Left	70	62	75	143	93	66	98	148	127
			Thru/Right	225	293	318	842	273	293	318	842	273
		WB	Left	105	82	37	86	31	82	37	86	31
			Thru	250	302	176	191	150	302	176	191	150
			Right	50	< 25	< 25	< 25	33	< 25	< 25	< 25	39

SOURCE: KITTELSON & ASSOCIATES, 2022.

Table 23: Opening Year (2032) Project Driveway Queuing

Driveway	Movement		Storage (ft.)	AM Queue (ft.)	MD Queue (ft.)	PM Queue (ft.)	Sat. Queue (ft.)
Curson Avenue Driveway	NB	Left	35	< 25	< 25	< 25	< 25
	EB	Left/Right	120	< 25	38	< 25	< 25
6th Street Driveway	NB	Left/Right	150	< 25	< 25	< 25	< 25

SOURCE: KITTELSON & ASSOCIATES, 2022.

Passenger Loading

As detailed earlier in this section, it is assumed that 10% of the project's vehicle trips will consist of ride-hailing trips that utilize passenger loading zones. Therefore, it is expected that approximately 31 net new ride-hailing trips will arrive at or depart the project during the weekday midday peak hour. When taking the existing site uses into account, it is estimated that the current ride-hailing demand at the site is 46 vehicles during the weekday midday hour, for a total of 77 vehicles when combining existing and net new demand.

The project site plan is conceptual at this time. However, it is estimated that the project provides approximately 520 feet of curb space for pick-up and drop-off, both within the parking lot and along 6th Street. That length of pick-up/drop-off space is likely sufficient to address existing and net new passenger loading demand, assuming that 1.5 feet of curb space is needed per vehicle demand over the hour.

RECOMMENDED IMPROVEMENTS

Several potential deficiencies may arise at the project driveways and in the study area.

- The project is expected to contribute to increased delay at the Curson Avenue/Wilshire Boulevard intersection, which operates at LOS F during the weekday midday, weekday PM, and Saturday midday peak hours. The Curson Avenue/Wilshire Boulevard intersection is utilized by multiple bus routes that run along Wilshire Boulevard.
- The northbound exiting approach from the 6th Street driveway is expected to experience LOS E conditions during the weekday AM and PM peak hours.
- At the Curson Avenue/Wilshire Boulevard intersection, the southbound queues may interfere with the crosswalks at the Curson Avenue/6th Street intersection and the northbound queues may conflict with the crosswalks at the Curson Avenue/8th Street intersection.
- The length of the eastbound and northbound queues at the Curson Avenue/6th Street intersection and southbound queues at the Curson Avenue/Wilshire Boulevard are expected to interfere with accessing the project driveways and may interfere with driveway operations
- Curbside passenger loading along 6th Street could result in conflicts with bicyclists once planned separated bike lanes are implemented.

In order to improve access safety and circulation, the project should coordinate with the City of Los Angeles to explore the feasibility of implementing the following improvements:

- The Curson Avenue/Wilshire Boulevard intersection is built out. Signal timing should be regularly updated to optimize splits. In addition, the weekday AM and PM peak period bus-only lanes on Wilshire could potentially be extended to the weekday midday and weekend midday peak hours to improve bus operations through that intersection.
- The Curson Avenue/6th Street intersection is built out. Signal timing should be regularly updated to optimize splits. In addition, striping could be improved to extend the northbound left turn lane at the intersection, and/or add an inbound left-turn lane at the project's Curson Avenue driveway.
- Incorporate safety features to accommodate passenger pick-up and drop-off along 6th Street when planned separated bike lanes are implemented.

In addition, driveway operations at Curson Avenue should be monitored.

Mitigation Measure #1, which requires the project to implement a TDM program and coordinate on multimodal improvements in the study area, can help reduce employee and visitor vehicle trips and related effects on project access safety and circulation.

PROJECT CONSTRUCTION

According to the City's TAG, development projects may be required to analyze if project construction would negatively affect pedestrian, bicycle, transit, or vehicle circulation in the area.

SCREENING

If a proposed project answers yes to any of the following, further analysis is required to assess whether the project would negatively affect circulation during construction.

- Would the project require construction activities to take place within the right-of-way of a Boulevard or Avenue (as designated in the Mobility Plan 2035) which would necessitate temporary lane, alley, or street closures for more than one day (including day and evening hours, and overnight closures if on a residential street)?
- Would the project require construction activities to take place within the right-of-way of a Collector or Local Street (as designated in the Mobility Plan 2035) which would necessitate temporary lane, alley, or street closures for more than seven days (including day and evening hours, and including overnight closures if on a residential street)?
- Would in-street construction activities result in the loss of regular vehicle, bicycle, or pedestrian access, including loss of bicycle parking to an existing land use for more than one day, including day and evening hours and overnight closures if access is lost to residential units?
- Would in-street construction activities result in the loss of regular ADA pedestrian access to an existing transit station, stop, or facility (e.g., layover zone) during revenue hours?
- Would in-street construction activities result in the temporary loss for more than one day of an existing bus stop or rerouting of a bus route that serves the project site?
- Would construction activities result in the temporary removal and/or loss of on-street metered parking for more than 30 days?
- Would the project involve a discretionary action to construct new buildings or additions of more than 1,000 square feet that require access for hauling construction materials and equipment from streets of less than 24-feet wide in a hillside area?

Project construction activity will depend on the phasing as funding is obtained to complete the master plan over the next seven to ten years. Because impacts to adjacent streets is likely yet unknown, further analysis may be required.

EVALUATION CRITERIA AND METHODOLOGY

The City's TAG identifies factors to be considered to determine if construction of a project would substantially interfere with pedestrian, bicycle, transit, or vehicle circulation.

These factors include location of the project site, the functional classification of the adjacent street, the availability of alternate routes or additional capacity, temporary loss of bicycle parking, temporary loss of bus stops or rerouting of transit lines, the duration of temporary loss of access, the operational constraints of the streets needed to access the construction sites in hillside areas that inhibit access by other residents and emergency service responders, the affected land uses, and the magnitude of the temporary construction activities.

ASSESSMENT

As shown in Figure 2, the site is surrounded by 6th Street to the north, Wilshire Boulevard to the south, and Curson Avenue to the east. Construction activity could occur on any of these roadways.

6th Street is an Avenue II street with a three-lane cross section (two westbound lanes and one eastbound lane) with a center median that allows for left-turning vehicles at intersections. Street parking is available along most of the north side of the street, while parking on the south side of the street is provided for portions of the street east of the LACMA parking garage driveway. There is existing sidewalk present on both sides and no current bike facilities. Construction could impede the sidewalk adjacent to the project site. Signalized crossings with high-visibility crosswalks are available along 6th Street on either side of the project site that could be used to detour pedestrians around a work zone. The parking lane could be

utilized by construction activity without impeding traffic flow. The center lane could be modified to a travel lane during construction to allow eastbound flow if needed.

Wilshire Boulevard is an Avenue I street with a four-lane cross section and a center median. Both eastbound and westbound directions have a joint parking lane/bus lane along the curb that allow for vehicle parking except during weekday AM and PM peak periods, where buses and right-turning vehicles have exclusive access to these lanes. There is existing sidewalk present on both sides and no current bike facilities. Construction could impede the sidewalk adjacent to the project site. Signalized crossings are available along Wilshire Boulevard on either side of the project site that could be used to detour pedestrians around a work zone. The parking/bus lane would be impacted by construction activity and impede bus access along Wilshire Boulevard. Westbound traffic would also likely be impeded during construction.

Curson Avenue is a Collector Street with a two-lane cross section. There is no on- street parking allowed on either side of the road with a bus loading zone on the west side fronting the project site. There is existing sidewalk present on both sides and no current bike facilities. Construction could impede the sidewalk adjacent to the project site. Signalized crossings are available along Curson Avenue on either side of the project site that could be used to detour pedestrians around a work zone. The bus loading area could be utilized by construction activity without impeding traffic flow, however traffic flow may be impacted by any construction activity due to the narrow roadway width.

While details of construction are not available at the Master Plan stage, it is anticipated that construction will create temporary impacts to pedestrian, transit, and vehicle circulation. Detour routes are available but the duration and level of the temporary impacts are not able to be identified until project phasing and associated construction needs are identified.

RECOMMENDED IMPROVEMENTS

The proposed project's likely impact during construction requires corrective measures. A construction traffic management plan will be required and coordinated with LADOT prior to starting construction on components of the Master Plan that require construction to impact the public right-of-way.

The construction traffic management plan should identify the duration and level of construction activity and consider the following features:

- Develop a detour plan for vehicles, pedestrians, and bicyclists as necessary.
- Consider modification of construction procedures to minimize duration or level of impact.
- Limit major road obstructions to off-peak hours.
- Coordinate with emergency service and public transit providers.
- Provide alternative vehicular, bicycle, and/or pedestrian access to affected parcels.
- Consult with LADOT if temporary closure of a travel lane may be necessary to maintain adequate pedestrian and bicycle access as part of the traffic management plan.
- Consult LADOT's Parking Meters Division regarding revenue recovery costs for the removal of parking meter spaces, if applicable.
- Coordinate access with adjacent property owners and tenants.
- Coordinate with Metro regarding maintenance of ADA access to Metro stations, stops, and transit facilities (e.g., layover zones) during revenue hours.
- Coordinate with transit providers regarding the need to temporarily close or relocate bus stops or reroute service.

RESIDENTIAL STREET CUT-THROUGH ANALYSIS

According to the City's TAG, development projects may be required to conduct a local residential street cut-through analysis to determine potential increases in average daily traffic (ADT) volumes on designated Local Streets near the project site that can be classified as cut-through trips generated by the project. Such trips could adversely affect the character and function of those streets.

Cut-through traffic can be exacerbated by development projects that add vehicle trips to congested roadways. Effects of cut-through traffic can include congestion, access issues, and speeding on Local Streets. Improvements to address cut-through traffic include traffic calming and diverting features.

SCREENING

If a proposed project answers yes to both of the following questions, further analysis may be required to assess whether the project would negatively affect Local Streets.

- Would the project generate a net increase of 250 or more daily vehicle trips?
- Does the land use project include a discretionary action that would be under review by the Department of City Planning?

The project would generate a net increase of more than 250 daily vehicle trips, and requires a discretionary action. Therefore, further analysis may be required.

The following conditions must also be present when selecting Local Street segments for analysis.

- The project is located along a currently congested Boulevard or Avenue and adds trips that may lead to trip diversion to parallel routes along residential Local Streets.
- The project is projected to add a substantial amount of automobile traffic to the congested Boulevard(s), Avenue(s), or Collector(s) that could potentially cause a shift to alternative route(s); and
- Nearby local residential street(s) (defined as Local streets as designated in the City's General Plan passing through a residential neighborhood) provide motorists with a viable alternative route. A viable alternative route is defined as one which is parallel and reasonably adjacent to the primary route as to make it attractive as an alternative to the primary route.

As shown in Table 20, the Curson Avenue/6th Street intersection is expected to operate at LOS E during the weekday AM and weekday PM peak hours under Opening Year Plus Project conditions. The proposed project will add trips to this intersection. However, there are no nearby residential streets that would provide motorists with a viable alternative route.

As shown in Table 20, the Curson Avenue/Wilshire Boulevard intersection is expected to operate at LOS F during the weekday AM, weekday midday, weekday PM, and weekend midday peak hours under Opening Year Plus Project conditions. In addition, northbound, southbound, and eastbound queues are anticipated to be substantial. The proposed project will add trips to this intersection. In addition, Stanley Avenue is in close proximity to Curson Avenue and could be a viable alternative detour for cars making a northbound through, northbound right-turn, or southbound through at the Curson Avenue/Wilshire Boulevard intersection. Therefore, Stanley Avenue south of Wilshire Boulevard should be studied to determine if there would be negative effects on this Local Street.

EVALUATION CRITERIA AND METHODOLOGY

The City's TAG states that local residential street must be deemed excessively burdened based on an increase in the projected average daily traffic (ADT) volumes as shown in Table 24.

Table 24: Substantial Residential Local Street Diversion Criteria

ADT with Project (Final ADT)	Project-Related Increase in ADT
1 to 999	120 or more
1,000 to 1,999	12 percent or more of final ADT
2,000 to 2,999	10 percent or more of final ADT
3,000 or more	8 percent or more of final ADT

SOURCE: CITY OF LOS ANGELES (2020).

To analyze conditions along residential streets, future year "without project" daily volumes should be developed using an ambient growth rate, and include traffic from related projects in the study area.

"With project" daily volumes along residential streets should be developed by forecasting the amount of peak hour and non-peak hour project trips that may shift away from a congested arterial or boulevard to the adjacent residential street.

ASSESSMENT

A 1% per year growth rate was applied to existing weekday and Saturday ADT along Stanley Avenue (between Wilshire Boulevard and 8th Street) to develop Opening Year 2032 ADT. A portion of peak hour trips from two related projects (Mixed-Use Project located at 5891 Olympic Boulevard and Wilshire Curson Project located at 5700 -5780 Wilshire Blvd / 712-752 S. Curson Ave / 5721-5773 W. 8th Street / 715-761 S. Masselin) were diverted from Curson Avenue and added to Opening Year 2032 ADT to obtain "without project" daily volumes. Then, peak hour trips from the proposed project were diverted from Curson Avenue and added to the "without project" daily volumes to obtain "with project" daily volumes. The final weekday ADT along Stanley Avenue is 1,615 vehicles; the final Saturday ADT is 906. The proposed project's contribution to the final ADT is less than 5% during both days and is therefore insufficient to require corrective measures. The project's low contribution to ADT can be attributed to the low percentage (4%) of project trips with are anticipated to utilize Curson Avenue south of Wilshire Boulevard.

RECOMMENDED IMPROVEMENTS

The proposed project's expected contribution to traffic on residential streets is anticipated to be below the City's thresholds. Therefore, no corrective measures have been recommended.

SPECIAL EVENTS

Regional attractions such as museums may host special events that generate different traffic patterns and parking demands compared to typical operations. These special events may have impacts to the surrounding roadway network and uses if not properly planned for. Consideration of special event activity should be considered.

ASSESSMENT

Special events at the La Brea Tar Pits currently occur on rare occasions. Most special events currently occur at the Natural History Museum located at 900 Exposition Boulevard instead of at the Page Museum because the NHM space is more accommodating of special events. With the completion of the proposed master plan the site will have larger space but is not designed for special events. The frequency of special events may change, but there are no plans to have regular special event space or any projection of demand to have those types of events. The adjacent LACMA facility has special events within the larger Hancock Park; however, these are not related to the 13-acre La Brea tarpits Master Plan site.

It is not anticipated that special events will occur as a result of the proposed project. However, a special event management plan should be created if events should occur to ensure traffic and parking do not adversely affect the surrounding neighborhoods.

RECOMMENDED IMPROVEMENTS

The proposed project should have corrective measures to address the potential of special events. A special event traffic management plan should be created in coordination with LADOT and confirmed prior to special events hosted at the site.

The special event traffic management plan may consider the following features:

- Vehicle parking supply
- Loading/unloading areas and management
- Traffic control at adjacent intersections and roadways
- Pedestrian circulation and facilities
- Bike parking supply
- Shuttle services

Section 6 — Mitigation Measures and Corrective Conditions

MITIGATION MEASURES AND CORRECTIVE CONDITIONS

SUMMARY OF CEQA MITIGATION MEASURES

The results of the transportation impact analysis are summarized below.

THRESHOLD T-1 (CONFLICTING WITH PLANS, PROGRAMS, ORDINANCES, OR POLICIES)

The project may conflict with the LAMC requirements for bicycle parking and TDM. In addition, it was determined that the project would be inconsistent with regional plans related to mobility and GHG reductions. The proposed project would result in a **significant impact** related to consistency with plans, programs, ordinances, or policies. The proposed project would also contribute to a **significant cumulative impact** related to consistency with plans, programs, ordinances, or policies.

Therefore, **Mitigation Measure #1** is proposed, detailed below.

Mitigation Measure #1 Transportation Demand Management (TDM) Program

To reduce Museum employee and visitor vehicle trips and increase alternative modes such as walking, bicycling, public transit, and rideshare, the proposed project shall prepare and implement a TDM program. The program shall be developed in consultation with LADOT.

The proposed project will designate an existing member of staff as the on-site TDM Coordinator. This coordinator shall be responsible for monitoring and tracking employee and visitor mode share and annual reporting to LADOT.

<u>Employee Strategies</u>

Information shall be distributed to employees and displayed on a bulletin board, display case, or kiosk (displaying transportation information) where the greatest number of employees are likely to see it. The following measures should be applied to reduce employee vehicle trips and VMT:

- Provide a transportation information bulletin board on-site with public transit information, contact information for rideshare and transit, ridesharing promotional material, bike route and facility information, and listing of on-site services or facilities.
- Provide facilities on-site to support bicycling to work, such as secure bike parking, showers, and lockers.
- Encourage and support participation in LA Metro vanpool, including subsidies for participation.
- Implement paid parking for employees.
- Subsidize transit passes.
- Offer flexible work schedules and telecommuting, when feasible.

<u>Visitor Strategies</u>

Transportation information for visitors should be displayed on the Museum's website and distributed with physical marketing materials. The following measures may be applied to reduce visitor vehicle trips and VMT:

- Advertise and offer discounted Museum tickets for visitors who use public transit or a bicycle to visit the project.

- Provide and maintain secure on-site bicycle parking for visitors, and monitor usage to determine if additional bicycle racks are needed.
    - Provide wayfinding signage directing bicyclists from the visitor entrances to where on-site bicycle parking is located.
    - Ensure bicycle parking is well lit and monitored by staff.
- Continue to have paid parking for visitors.
- Coordinate with LA Metro to improve transit access and user comfort and encourage visitors to take local bus service or the future Purple Line extension to the Museum, through the following measures:
    - Improve pedestrian wayfinding between the planned Purple Line station, local bus stops, and the Museum.
    - Implement bus stop improvements such as shelters along Wilshire Boulevard bus stops that would be used by Museum visitors.
    - Coordinate with LA Metro and the City of Los Angeles to ensure that safe and comfortable pedestrian facilities (such as ADA curb ramps and continental crosswalks) are available between local bus stops and the project entrances, including at the Curson Avenue/ Wilshire Boulevard intersection.
- Coordinate with the City of Los Angeles to implement planned bikeways in the vicinity of the project site, and contribute to the implementation of the bikeways. This includes planned bikeways along Wilshire Boulevard and 6th Street.

Implementation of Mitigation Measure #1 would encourage employees and visitors to reduce their vehicle trips, and contribute to VMT and GHG reduction goals. This measure also supports multimodal connectivity in the study area. With the implementation of Mitigation Measure #1, the impact related to consistency with plans, programs, ordinances, or policies would be reduced to **less than significant with mitigation**. In addition, the cumulative impact related to consistency with plans, programs, ordinances, or policies would be reduced to **less than significant with mitigation**.

THRESHOLD T-2 (CAUSING SUBSTANTIAL VEHICLE MILES TRAVELED),

Given that the project would result in a net increase in VMT, the proposed project would result in a **significant impact** related to causing substantial vehicle miles traveled, and would contribute to a **significant cumulative impact** related to causing substantial vehicle miles traveled.

Mitigation Measure #1, which requires the project to implement a TDM program and coordinate on multimodal improvements in the study area, can help reduce employee and visitor VMT and support multimodal connectivity.

Given the magnitude of VMT that would need to be reduced due to visitor trips being 196% longer than average regional recreation trips, Mitigation Measure #1 would be insufficient to reduce VMT to less-than-significant levels. Therefore, even with the implementation of Mitigation Measure #1, the impact related to causing substantial vehicle miles traveled would remain **significant and unavoidable** after mitigation. In addition, the cumulative impact related to causing substantial vehicle miles traveled would remain **significant and unavoidable** after mitigation.

THRESHOLD T-3 (SUBSTANTIALLY INCREASING HAZARDS DUE TO A GEOMETRIC DESIGN FEATURE OR INCOMPATIBLE USE

Based on the proposed site plan and evaluation of geometric design and uses, the proposed project would result in a **less than significant impact** when considering increasing hazards. The proposed project would also result in a **less than significant cumulative impact** when considering increasing hazards based on the geometric design and uses of the proposed project.

No mitigation measures are needed to address potential hazards for the proposed project.

SUMMARY OF NON-CEQA ASSESSMENT RECOMMENDATIONS

The results of the non-CEQA transportation analysis are summarized below.

PEDESTRIAN, BICYCLE, AND TRANSIT ACCESS ASSESSMENT

In order to improve pedestrian and transit access in the study area, the project should coordinate with the City of Los Angeles to explore the feasibility of implementing the following improvements:

- Continental crosswalks at the Curson Avenue/Wilshire Boulevard intersection and frontage road crossing directly to the east of the intersection;
- High-visibility curb ramps with truncated domes at the Spaulding Avenue/Wilshire Boulevard intersection, Curson Avenue/Wilshire Boulevard intersection, and frontage road crossing directly to the east of the Curson Avenue/Wilshire Boulevard intersection; and
- Pedestrian recall timing (as opposed to pedestrian push buttons) for the north-south crosswalks at the Curson Avenue/Wilshire Boulevard and Spaulding Avenue/Wilshire Boulevard intersections.

In order to improve transit access in the study area, the project should coordinate with the City of Los Angeles and LA Metro to install shelters at the two Spaulding Avenue/Wilshire Boulevard stops and one Curson Avenue/Wilshire Boulevard stop that currently lack them.

PROJECT ACCESS SAFETY AND CIRCULATION EVALUATION

Several potential deficiencies may arise at the project driveways and in the study area.

- The project is expected to contribute to increased delay at the Curson Avenue/Wilshire Boulevard intersection, which operates at LOS F during the weekday midday, weekday PM, and Saturday midday peak hours. The Curson Avenue/Wilshire Boulevard intersection is utilized by multiple bus routes that run along Wilshire Boulevard.
- The northbound exiting approach from the 6th Street driveway is expected to experience LOS E conditions during the weekday AM and PM peak hours.
- At the Curson Avenue/Wilshire Boulevard intersection, the southbound queues may interfere with the crosswalks at the Curson Avenue/6th Street intersection and the northbound queues may conflict with the crosswalks at the Curson Avenue/8th Street intersection.
- The length of the eastbound and northbound queues at the Curson Avenue/6th Street intersection and southbound queues at the Curson Avenue/Wilshire Boulevard are expected to interfere with accessing the project driveways and may interfere with driveway operations
- Curbside passenger loading along 6th Street could result in conflicts with bicyclists once planned separated bike lanes are implemented.

In order to improve access safety and circulation, the project should coordinate with the City of Los Angeles to explore the feasibility of implementing the following improvements:

- The Curson Avenue/Wilshire Boulevard intersection is built out. Signal timing should be regularly updated to optimize splits. In addition, the weekday AM and PM peak period bus-only lanes on Wilshire could potentially be extended to the weekday midday and weekend midday peak hours to improve bus operations through that intersection.
- The Curson Avenue/6th Street intersection is built out. Signal timing should be regularly updated to optimize splits. In addition, striping could be improved to extend the northbound left turn lane at the intersection, and/or add an inbound left-turn lane at the project's Curson Avenue driveway.
- Incorporate safety features to accommodate passenger pick-up and drop-off along 6th Street when planned separated bike lanes are implemented.

In addition, driveway operations at Curson Avenue should be monitored.

Mitigation Measure #1, which requires the project to implement a TDM program and coordinate on multimodal improvements in the study area, can help reduce employee and visitor vehicle trips and related effects on project access safety and circulation.

PROJECT CONSTRUCTION

The proposed project's likely impact during construction requires corrective measures. A construction traffic management plan will be required and coordinated with LADOT prior to starting construction on components of the Master Plan that require construction to impact the public right-of-way.

The construction traffic management plan should identify the duration and level of construction activity and consider the following features:

- Develop a detour plan for vehicles, pedestrians, and bicyclists as necessary.
- Consider modification of construction procedures to minimize duration or level of impact.
- Limit major road obstructions to off-peak hours.
- Coordinate with emergency service and public transit providers.
- Provide alternative vehicular, bicycle, and/or pedestrian access to affected parcels.
- Consult with LADOT if temporary closure of a travel lane may be necessary to maintain adequate pedestrian and bicycle access as part of the traffic management plan.
- Consult LADOT's Parking Meters Division regarding revenue recovery costs for the removal of parking meter spaces, if applicable.
- Coordinate access with adjacent property owners and tenants.
- Coordinate with Metro regarding maintenance of ADA access to Metro stations, stops, and transit facilities (e.g., layover zones) during revenue hours.
- Coordinate with transit providers regarding the need to temporarily close or relocate bus stops or reroute service.

RESIDENTIAL STREET CUT-THROUGH ANALYSIS

The proposed project's expected contribution to traffic on residential streets is anticipated to be below the City's thresholds. Therefore, no corrective measures have been recommended.

SPECIAL EVENTS

The proposed project should have corrective measures to address the potential of special events. A special event traffic management plan should be created in coordination with LADOT and confirmed prior to special events hosted at the site.

The special event traffic management plan may consider the following features:

- Vehicle parking supply
- Loading/unloading areas and management
- Traffic control at adjacent intersections and roadways
- Pedestrian circulation and facilities
- Bike parking supply
- Shuttle services

Appendix 1 — Memorandum of Understanding

LADOT

Transportation Assessment Memorandum of Understanding (MOU)

This MOU acknowledges that the Transportation Assessment for the following Project will be prepared in accordance with the latest version of LADOT's Transportation Assessment Guidelines:

I. Project Information

Project Name: La Brea Tar Pits and Museum Master Plan EIR

Project Address: 5801 Wilshire Boulevard, Los Angeles, CA 90036

The proposed project would renovate the existing Page Museum and add a new one-story museum building toward the northwest, increasing the total museum square footage from 63k gsf to 105k gsf. The new museum building would include a lobby and exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock.

LADOT Project Case Number: _____ Project Site Plan attached? *(Required)* ☒Yes ☐ No

II. Transportation Demand Management (TDM) Measures

Provide any transportation demand management measures that are being considered where the eligibility needs to be verified in advance (e.g. bike share kiosks, unbundled parking, microstransit service, etc.). Note that LADOT staff will make the final determination if TDM measures eligibility for a particular project. Please confirm eligibility with the LADOT Planning and Bureau staff assigned to your project.

1 N/A 3 _____

2 _____ 4 _____

Select any TDM measures that are currently being considered that may be eligible as a Project Design Feature[1]:

	Reduced Parking Supply[2]
	Bicycle Parking and Amenities
	Parking Cash Out

III. Trip Generation

Trip Generation Rate(s) Source: ITE 10th Edition / (Other) Existing site attendance data (see attachment)

Trip Generation Adjustment *(Exact amount of credit subject to approval by LADOT)*	Yes	No
Transit Usage	☒	☐
Existing Active or Previous Land Use	☒	☐
Internal Trip	☐	☒
Pass-By Trip	☐	☒
Transportation Demand Management (See above)	☐	☒

Trip generation table including a description of the existing and proposed land uses, rates, estimated morning and afternoon peak hour volumes (ins/outs/totals), proposed trip credits, etc. attached? *(Required)* ☒Yes ☐ No

	IN	OUT	TOTAL
Weekday AM Trips	12	0	12
Weekday Midday Trips	107	199	306
Weekday PM Trips	16	69	85
Saturday Midday Trips	145	139	284

NET Daily Vehicle Trips (DVT)
1,293 (Weekday) Based on employee
1,679 (Saturday) and attendance data

es that are also shown to be needed to comply with a local ordinance, affordable housing incentive program, or state law.

[2]Select if reduced parking supply is pursued as a result of a parking incentive as permitted by the City's Bicycle Parking Ordinance, State Density Bonus Law, or a the City/s Transit Oriented ted Community Guidelines.

LADOT

City of Los Angeles Transportation Assessment MOU
LADOT Project Case No: _____

IV. Study Area and Assumptions

Project Buildout Year: 2032 Ambient Growth Rate: 1 % Per Yr.

Related Projects List, researched by the consultant and approved by LADOT, attached? *(Required)* ☒ Yes ☐ No

STUDY INTERSECTIONS and/or STREET SEGMENTS *(May be subject to LADOT revision after access, safety and circulation evaluation)*

1 Ogden Drive / 6th Street
2 Curson Avenue / 6th Street
Curson Avenue / Wilshire Boulevard
3 Spaulding Avenue / Wilshire Boulevard
4 Ogden Drive / Wilshire Boulevard
All project driveways

Is this Project located on a street within the High Injury Network? ☒ Yes ☐ No

V. ACCESS ASSESSMENT

a. Does the project exceed 1,000 total DVT? ☒ Yes ☐ No
b. Is the project's frontage 250 linear feet or more along an Avenue or Boulevard as classified by the City's General Plan? ☒ Yes ☐ No
c. Is the project's building frontage encompassing an entire block along an Avenue or Boulevard as classified by the City's General Plan? ☐ Yes ☒ No

If questions a., b., or c. is Yes then complete **Attachment C.1: Access Assessment Criteria**.

VI. SITE PLAN and map of Study Area

Does the attached site plan or map of study area show	Yes	No	Not Applicable
Each study intersection and/or street segment	☒	☐	☐
Project Vehicle Peak Hour trips at each study intersection	☒	☐	☐
Project Vehicle Peak Hour trips at each project access point	☒	☐	☐
Project driveways (show widths and directions or lane assignment)	☒	☐	☐
Pedestrian access points and any pedestrian paths	☒	☐	☐
Pedestrian loading zones	☒	☐	☐
Delivery loading zone or area	☒	☐	☐
Bicycle parking onsite	☒	☐	☐
Bicycle parking offsite (in public right-of-way)	☒	☐	☐

VII. Contact Information

	CONSULTANT	DEVELOPER
Name:	Mychal Loomis, Kittelson & Associates	Natural History Museum of LA County
Address:	750 The City Drive, Suite 410 Orange, CA 92868	900 Exposition Blvd, Los Angeles CA 90007
Phone Number:	(714) 468-1180	213-763-3303
E-Mail:	mloomis@kittelson.com	dmcdivitt@nhm.org

Approved by:	x Mychal Loomis	05/02/22	x	5/2/22
	Consultant's Representative	Date	LADOT Representative	*Date

*MOUs are generally valid for two years after signing. If after two years a transportation assessment has not been submitted to LADOT, the developer's representative shall check with the appropriate LADOT office to determine if the terms of this MOU are still valid or if a new MOU is needed.

LADOT Access Assessment Criteria

This Criteria acknowledges that the Transportation Assessment for the following Project will be prepared in accordance with the latest version of LADOT's Transportation Assessment Guidelines:

I. PROJECT INFORMATION

Project Name: La Brea Tar Pits and Museum Master Plan EIR

Project Address: 5801 Wilshire Boulevard, Los Angeles, CA 90036

Project Description: The proposed project would renovate the existing Page Museum and add a new one-story museum building toward the northwest, increasing the total museum square footage from 63k gsf to 105k gsf. The new museum building would include a lobby and exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock.

LADOT Project Case Number: _____

II. PEDESTRIAN/ PERSON TRIP GENERATION

Source of Pedestrian/Person Trip Generation Rate(s)? □ VMT Calculator □ ITE 10th Edition ☒ Other: Existing site attendance data (see attachment)

	Land Use	Size/Unit	Daily Person Trips	Saturday
Proposed	Museum	42 KSF	2,701	3,523
		Total new trips:	2,701	3,523

Pedestrian/Person trip generation table including a description of the proposed land uses, trip credits, person trip assumptions, comparison studies used for reference, etc. attached? □ Yes □ No

III. PEDESTRIAN ATTRACTORS INVENTORY

Attach Pedestrian Map for the area (1,320 foot radius from edge of the project site) depicting:

- site pedestrian entrance(s)
- Existing or proposed passenger loading zones
- pedestrian generation/distribution values
  - Geographic Distribution: N 15 % S 39 % E 21 % W 25 %
- transit boarding and alighting of transit stops (should include Metro rail stations; Metro, DASH, and other municipal bus stops)
- Key pedestrian destinations with hours of operation:
  - schools (school times)
  - government offices with a public counter or meeting room
  - senior citizen centers
  - recreation centers or playgrounds
  - public libraries
  - medical centers or clinics
  - child care facilities
  - post offices

- places of worship
- grocery stores
- other facilities that attract pedestrian trips

- pedestrian walking routes to key destinations from project site

Note: Pedestrian Count Summary, Bicycle Count Summary, Manual Traffic Count Summary will need to be attached to the Transportation Assessment

IV. FACILITIES INVENTORY

Is a High Injury Network street located within 1,320 foot radius from the edge of the project site? ☒ Yes ☐ No

If yes, list streets and include distance from the project:

Wilshire Blvd. (east of Fairfax Ave.)	at 0 (feet)
6th St. (east of Ogden Dr.)	at 700 (feet)
Fairfax Ave. (north of Wilshire Blvd.)	at 0 (feet)
	at _____ (feet)

Attach Radius Map for the area (1,320 foot radius from edge of the project site) depicting the following existing and proposed facilities:

- transit stops
- bike facilities
- traffic control devices for controlled crossings
- uncontrolled crosswalks
- location of any missing, damaged or substandard sidewalks

For a reference of planned facilities, see the Transportation Assessment Support Map

Crossing Distances

Does the project property have frontage along an arterial street (designated as either an Avenue or Boulevard?)

☒ Yes ☐ No

If yes, provide the distance between the crossing control devices (e.g. signalized crosswalk, or controlled mid-block crossing) along any arterial within 1,320 feet of the property.

75 (feet) at Wilshire Blvd.	_____ (feet) at _____
55 (feet) at 6th St.	_____ (feet) at _____
55 - 62 (feet) at Fairfax Ave.	_____ (feet) at _____
_____ (feet) at _____	_____ (feet) at _____
_____ (feet) at _____	_____ (feet) at _____
_____ (feet) at _____	_____ (feet) at _____

V. Project Construction

Will the project require any construction activity within the city right-of-way? ☒ Yes ☐ No

If yes, will the project require temporary closure of any of the following city facilities?

- sidewalk -- Yes
- bike lane
- parking lane
- travel lane
- bus stop -- Yes
- bicycle parking (racks or corrals)
- bike share or other micro-mobility station
- car share station
- parklet
- other: _____

LA BREA TAR PITS MASTER PLAN

Conceptual Site Plan
Figure 1

Los Angeles County, CA
34.0637°N 118.3576°W

N

Base Map: Weiss-Manfredi, 2021
Accessed February 2022
Updated: 2/2/2022
Project No. 63953
Layout: 63953_LaBrea_SitePlan
Apx. 63953 La Brea

SWCA
ENVIRONMENTAL CONSULTANTS

Study Intersection
Parking
Pedestrian Entrances
Bike Rack
Study Segment
Passenger Loading Zones
Delivery Loading Zone
Pedestrian Walking Routes

Scale in Feet
0 300
North

LA BREA TAR PITS & MUSEUM

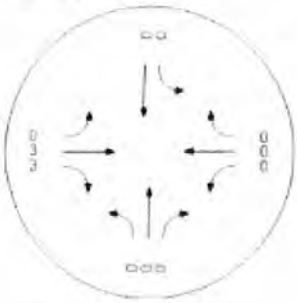
Page Museum | Master Plan EIR

Project Site and Study Area

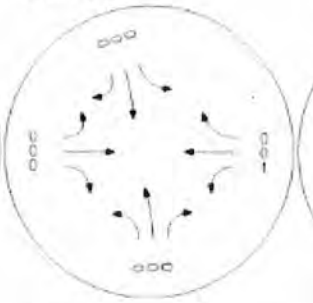
Figure 2

Figure 3: Weekday AM Peak Hour Project Vehicle Trips

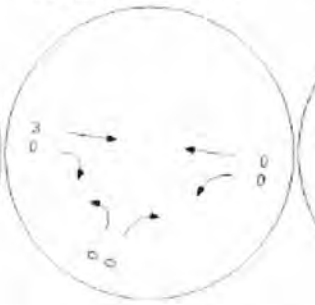
1. Ogden Drive / 6th Street



2. Curson Avenue / 6th Street

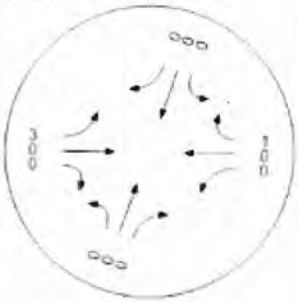


3. Ogden Drive / Wilshire Boulevard

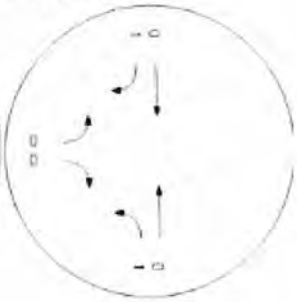


4. Spaulding Avenue / Wilshire Boulevard

5. Curson Avenue / Wilshire Boulevard

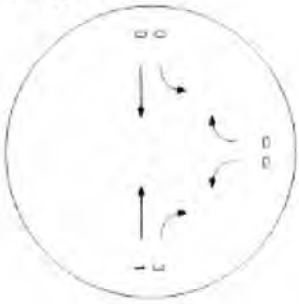


Curson Avenue Driveway

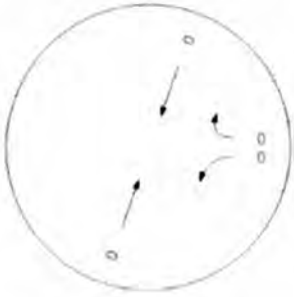


6th Street Driveway

SAG (Curson Avenue entry/exit)



Wilshire Courtyard (Curson Avenue exit)

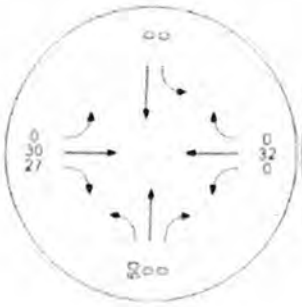


Wilshire Courtyard (Courtyard Place entry)

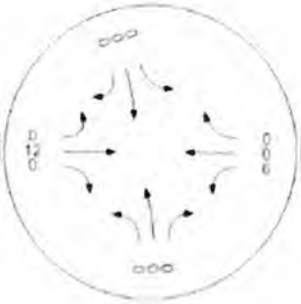
Notes:
Numbered locations denote study intersections.
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.

Figure 4: Weekday Midday Peak Hour Project Vehicle Trips

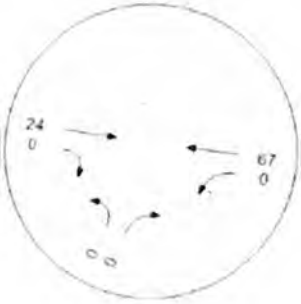
1. Ogden Drive / 6th Street



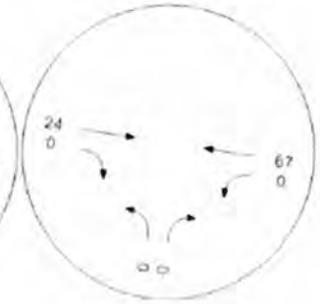
2. Curson Avenue / 6th Street



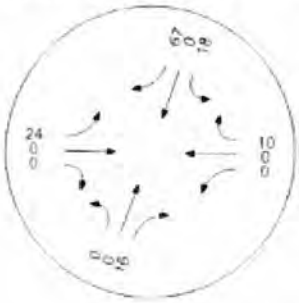
3. Ogden Drive / Wilshire Boulevard



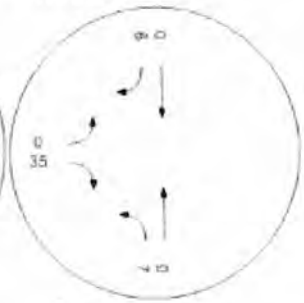
4. Spaulding Avenue / Wilshire Boulevard



5. Curson Avenue / Wilshire Boulevard

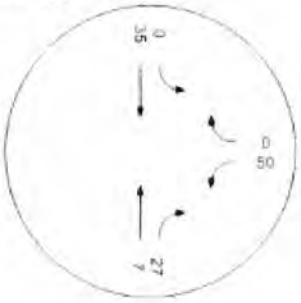


Curson Avenue Driveway

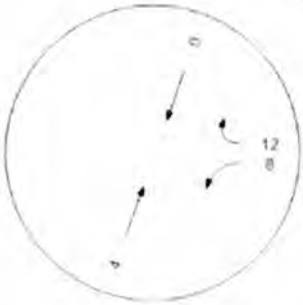


6th Street Driveway

SAG (Curson Avenue entry/exit)



Wilshire Courtyard (Curson Avenue exit)

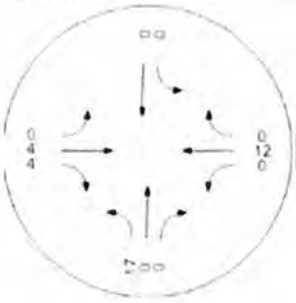


Wilshire Courtyard (Courtyard Place entry)

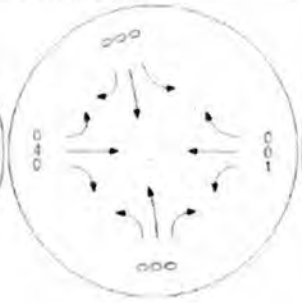
Notes:
Numbered locations denote study intersections.
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.

Figure 5: Weekday PM Peak Hour Project Vehicle Trips

1. Ogden Drive / 6th Street

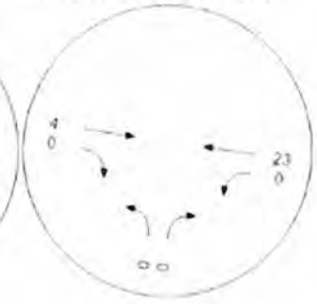


2. Curson Avenue / 6th Street

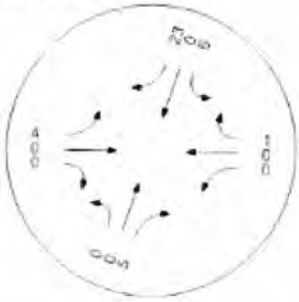


3. Ogden Drive / Wilshire Boulevard

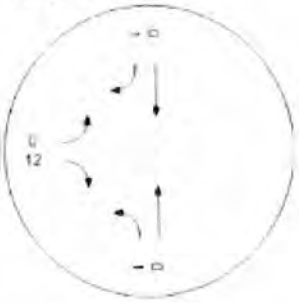
4. Spaulding Avenue / Wilshire Boulevard



5. Curson Avenue / Wilshire Boulevard

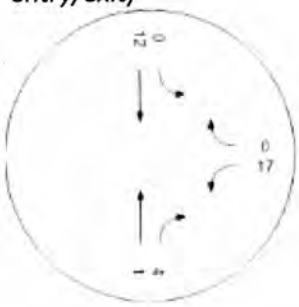


Curson Avenue Driveway

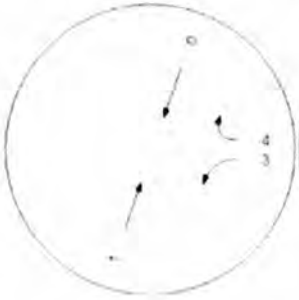


6th Street Driveway

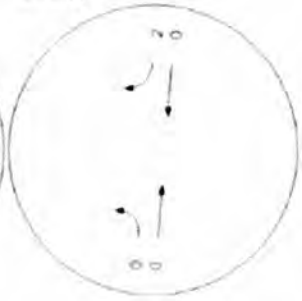
SAG (Curson Avenue entry/exit)



Wilshire Courtyard (Curson Avenue exit)



Wilshire Courtyard (Courtyard Place entry)



Notes:
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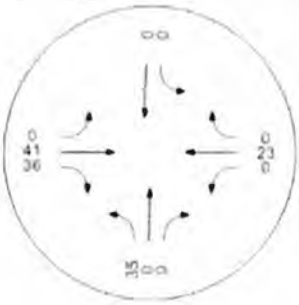
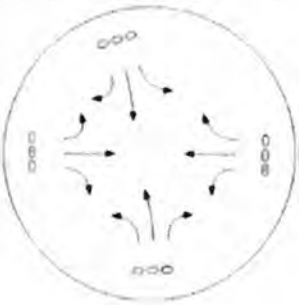
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.

Figure 6: Saturday Midday Peak Hour Project Vehicle Trips

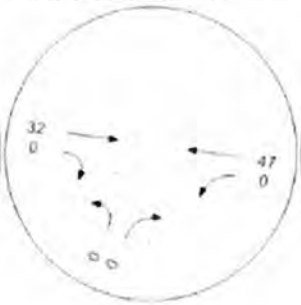
1. Ogden Drive / 6th Street



2. Curson Avenue / 6th Street

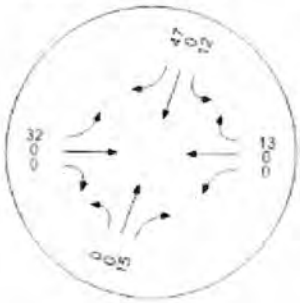


3. Ogden Drive / Wilshire Boulevard



4. Spaulding Avenue / Wilshire Boulevard

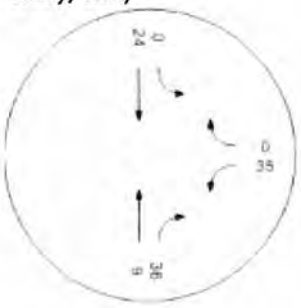
5. Curson Avenue / Wilshire Boulevard



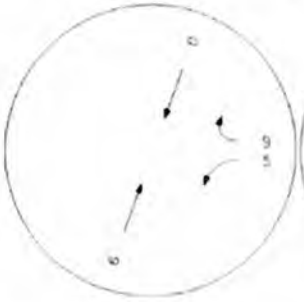
Curson Avenue Driveway

6th Street Driveway

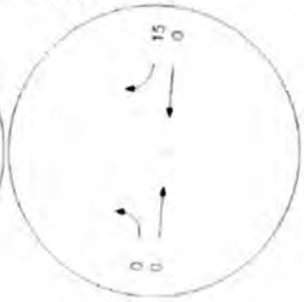
SAG (Curson Avenue entry/exit)



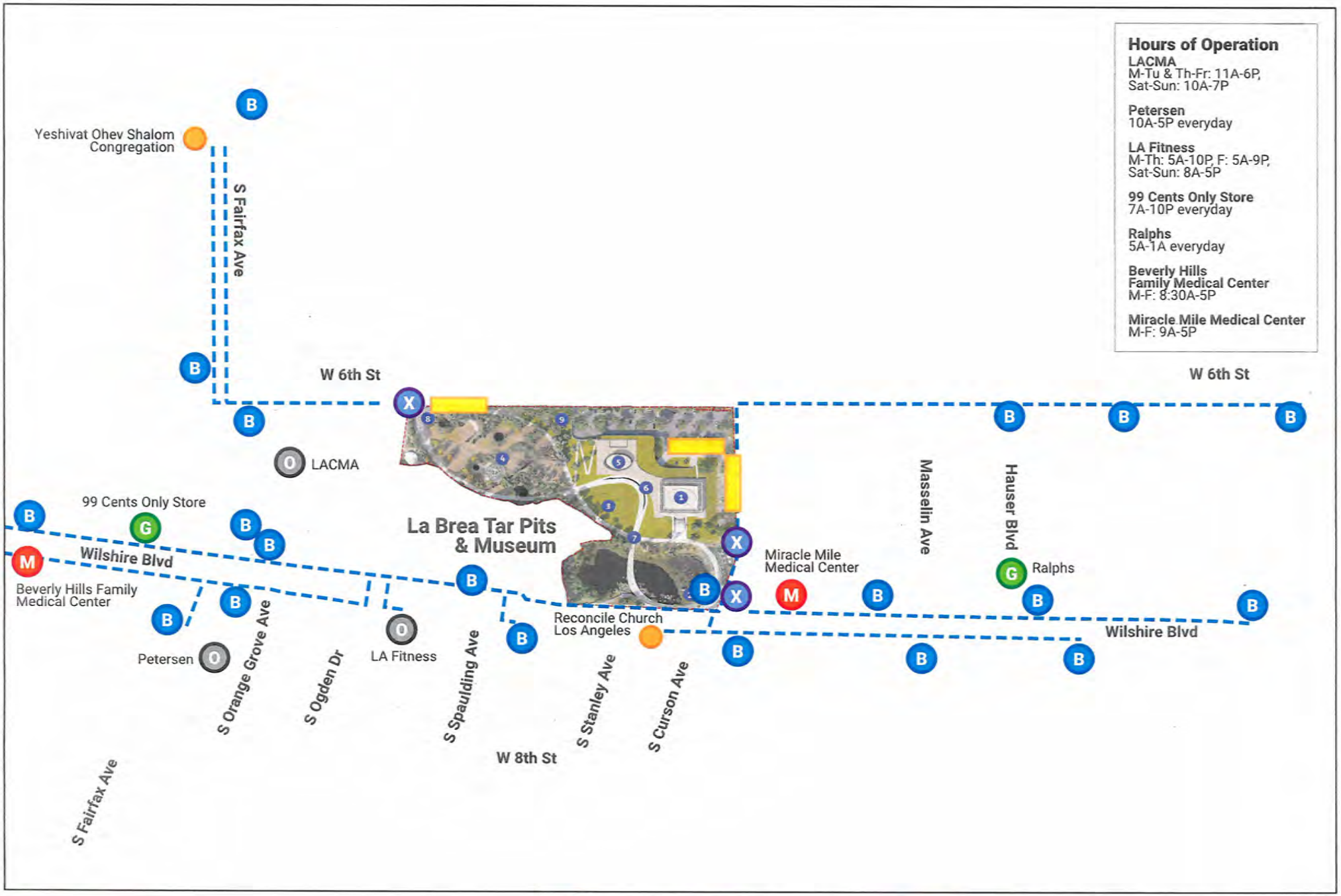
Wilshire Courtyard (Curson Avenue exit)



Wilshire Courtyard (Courtyard Place entry)



Notes:
Numbered locations denote study intersections.
Bolded locations denote project parking lot driveways.
Italicized locations denote other (off-site) parking garage access points.



Existing Bus Stop
Grocery Store
Medical Center
Pedestrian Entrances
Other Pedestrian Generator
Place of Worship
Passenger Loading Zones
Pedestrian Walking Routes

Scale in Feet
0 600
North

LA BREA TAR PITS & MUSEUM

Page Museum | Master Plan EIR

Pedestrian Generators

Figure 7

LA BREA TAR PITS & MUSEUM

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Facilities Inventory

Figure 8

Traffic Counts

Traffic counts will be collected at the locations listed below.

New multimodal (vehicle/bicycle/pedestrian) counts will be collected on one weekday during three peak periods (morning 7:00-9:00AM, midday 12:00-2:00PM, and afternoon/evening 4:00-6:00PM) and one Saturday midday peak period (12:00-2:00PM) at the following intersections:

- Ogden Drive / 6th Street
- Curson Avenue / 6th Street
- Ogden Drive / Wilshire Boulevard
- Spaulding Avenue / Wilshire Boulevard
- Curson Avenue / Wilshire Boulevard

New 24-hour vehicle counts will be collected during one weekday and one Saturday at the following roadway segments:

- 8th Street (between Fairfax Avenue and Orange Grove Avenue)
- 8th Street (between Stanley Avenue and Curson Avenue)
- Orange Grove Avenue (between Wilshire Boulevard and 8th Street)
- Ogden Drive (between Wilshire Boulevard and 8th Street)
- Spaulding Avenue (between Wilshire Boulevard and 8th Street)
- Stanley Avenue (between Wilshire Boulevard and 8th Street)
- Curson Avenue (between Wilshire Boulevard and 8th Street)

Trip Generation

Trip generation for the proposed expansion was prepared by estimating existing site trip generation for the weekday daily, weekday AM peak hour, weekday midday peak hour, weekday PM peak hour, Saturday daily, and Saturday midday peak hour periods. Existing trip generation was estimated for employees and for visitors. Then, the trip generation rates were applied to the proposed increase in museum square footage.

Employee Trips

The following employee trip generation rates were developed using mode share information from 2019 Los Angeles County Natural History Museum employee travel surveys. The trip generation rates would developed with the assumption that 100% of all employees arrive at the site during the AM peak hour and 100% of all employees exit the site during the PM peak hour. Note, since weekend surveys were not available, the same trip generation rates and patterns would be used to estimate Saturday daily and midday peak hour employee trip generation.

- **Daily**: 1.40 vehicle trips per employee
- **AM peak hour**: 0.70 vehicle trips per employee
- **Midday peak hour**: 0.00 vehicle trips per employee
- **PM peak hour**: 0.70 vehicle trips per employee

Currently, the museum staff consists of 25 employees. The proposed expansion would increase the museum square footage by approximately 67%. To estimate the net increase in employee trip generation, it was assumed that the number of employees would also increase by 67%, or 17 additional employees. This results in net employee trip generation of 24 weekday daily trips, 12 weekday AM peak hour daily trips, 12 weekday PM peak hour daily trips, and 24 Saturday daily trips.

Table 1: Employee Trip Generation Estimate (Net Increase)

Trip Generation Rates							
Rate	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Per employee	1.40	100%	0%	0.70	0%	100%	0.70
Trip Generation Estimates							
Size	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
17 employees	24	12	0	12	0	12	12

Visitor Trips

Visitor trip generation was developed through the following steps:

1. Estimate person trip generation for the existing museum
2. Apply the appropriate mode share to obtain existing vehicle trip generation
3. Develop trip generation rates
4. Apply those rates to the increase in museum square footage to obtain net vehicle trip generation and bicycle, pedestrian, and transit trip generation

The project applicant provided monthly and daily attendance data for January 2017 through December 2021. July 2017 experienced the highest number of visitors (58,248). Therefore, person trip generation was estimated using weekday and Saturday data from that month. The busiest weekdays and Saturdays from that month are listed below.

- Weekdays
  - 7/3 – 2,815 visitors
  - 7/26 – 2,026 visitors
  - 7/28 – 1,998 visitors
- Saturdays
  - 7/15 – 2,473 visitors
  - 7/22 – 2,642 visitors
  - 7/29 – 2,607 visitors

July 26, 2017, was selected for estimating weekday trip generation (July 3rd was part of the long July 4th weekend and would not be representative of typical weekday activity levels). July 22, 2017, was selected for estimating Saturday trip generation.

The ticket counter information provided by the applicant included the time of entry. According to the applicant, the average length of a visit is between approximately 60 and 90 minutes; therefore, 75 minutes was used.

Existing weekday and Saturday person trip generation were estimated based on the daily total visitors for both days. Weekday midday peak hour, weekday PM peak hour, and Saturday midday peak hour person trip generation and inbound/outbound percentages were developed by examining the highest-volume hours during those peak periods (weekday AM peak hour trip generation was not estimated since the museum is closed at that time and did not have any visitors). Existing person-trips and person-trip generation rates for the museum are detailed in the attached matrix. Existing person-trip estimates are listed below:

- **Weekday daily**: 4,052 person-trips
- **Weekday midday peak hour**: 977 person-trips
- **Weekday PM peak hour**: 232 person-trips
- **Saturday daily**: 5,284 person-trips
- **Saturday midday peak hour**: 907 person-trips

Data from the California Household Travel Survey (CHTS)[1] was utilized to estimate the mode share and trips by mode for existing site visitors, to then prepare vehicle trip generation rates and other modal trip generation rates for the site. According to the CHTS, mode share for recreational trips for zip codes in the city is as follows:

- **Vehicle Driver**: 42%
- **Vehicle Passenger**: 27%
- **Transit**: 2%
- **Bike**: 1%
- **Walk**: 28%

The CHTS's 28% mode share for this project may be too high, given its role as a regional (as opposed to local-serving) recreational attraction. Therefore, the walking mode share assumption is capped at 10%, with the remainder distributed among vehicle driver, vehicle passenger, and transit. This mode share assumption also acknowledges the density of existing and future transit service in the area (including the Purple Line extension):

- **Vehicle Driver**: 47%
- **Vehicle Passenger**: 30%
- **Transit**: 12%
- **Bike**: 1%
- **Walk**: 10%

The detailed existing site trips by mode and modal trip generation rates are provided in the attached matrices. The modal trip generation rates were applied to the net increase in museum square footage (42,000 square feet) to estimate the net increase in visitor vehicle trips and other modes. Tables 2 through 5 below display the visitor trip generation rates and net trip generation estimates for each mode for the museum expansion.

[1] https://www.nrel.gov/transportation/secure-transportation-data/tsdc-california-travel-survey.html

Table 2: Visitor Vehicle Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	30.22	35%	65%	7.29	22%	78%	1.73	39.41	51%	49%	6.76
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	1,269	107	199	306	16	57	73	1,655	145	139	284

Table 3: Visitor Transit Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	7.71	35%	65%	1.86	22%	78%	0.44	10.06	51%	49%	1.73
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	324	27	51	78	4	14	18	423	37	36	73

Table 4: Visitor Bike Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	0.65	35%	65%	0.16	22%	78%	0.03	0.84	51%	49%	0.14
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	27	2	5	7	0	1	1	35	3	3	6

Table 5: Visitor Walking Trip Generation Estimate (Net Increase)

Trip Generation Rates											
	Weekday							Saturday			
Rate	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Per KSF	6.43	35%	65%	1.56	22%	78%	0.37	8.38	51%	49%	1.44
Trip Generation Estimates											
	Weekday							Saturday			
Size	Daily	Midday Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
42 KSF	270	23	43	66	4	12	16	352	31	29	60

Net Vehicle Trip Generation Estimate

The estimated net increase in vehicle trips generated by the museum expansion is detailed below, combining the net increases for both employee and visitor vehicle trips.

Table 6: Net Vehicle Trip Generation Estimate

Weekday									
Daily	AM Peak Hour			Midday Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
1,293	12	0	12	107	199	306	16	69	85
Saturday									
Daily	AM Peak Hour			Midday Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
1,679	*(not analyzed)*			145	139	284	*(not analyzed)*		

Trip Distribution

Trip distribution percentage will be based on information provided in the LACMA EIR traffic study:

- 35% to/from the south via Fairfax Avenue
- 22% to/from the west via Wilshire Boulevard
- 3% to/from the west via 6th Street
- 15% to/from the north via Fairfax Avenue
- 6% to/from the east via 6th Street
- 15% to/from the east via Wilshire Boulevard
- 4% to/from the south via Curson Avenue

Vehicle Trip Assignment

As shown on the study area map, the project site will include a parking lot with two access points: one access point along 6th Street (west of Curson Avenue) and one access point along Curson Avenue (south of 6th Street. An increase in the on-site parking supply is not anticipated. In addition, there are several other parking structures in the vicinity of the project site:

- LACMA (entry/exit at the Ogden Drive/6th Street intersection)
- SAG (entry and exit on Curson Avenue)
- Wilshire Courtyard (entry on Courtyard Place, exit on Curson Avenue)
- Petersen Automotive Museum (entry on Fairfax Avenue, exit on Orange Grove Avenue)
- Future Purple Line parking garage (under construction and not included as part of the vehicle trip assignment)

According to a 2019 study,[2] ride-hailing services such as Uber and Lyft account for approximately 3% of trips in Los Angeles. Given that the proposed project will include two passenger drop-off locations (within the parking lot and curbside along 6th Street) and the increased popularity of transportation

[2] https://www.fehrandpeers.com/what-are-tncs-share-of-vmt/

network company services, it is assumed that a higher percentage (10%) of the project's vehicle trips will consist of ride-hailing trips that utilize the on-site passenger loading zones. Of the remaining 90% of vehicle trips, the parking location assignment assumptions are as follows:

- Project's on-site parking: 30%
- LACMA: 25%
- SAG: 25%
- Wilshire Courtyard: 10%

Attachment: Visitor Trip Generation Calculations

Existing Site Person Trips and Person Trip Generation (per KSF)

	Weekday												Saturday					
Existing Person Trips	Daily	in	out	AM	in	out	MD	in	out	PM	in	out	Daily	in	out	MD	in	out
	4,052	2,026	2,026				977	342	635	232	51	181	5,284	2,642	2,642	907	461	446
	64.32	50%	50%	--	--	--	15.51	35%	65%	3.68	22%	78%	83.87	50%	50%	14.40	51%	49%

	CHTS Mode Share (Recreation Trips, City of LA)				
Mode Share	Driver	Pass.	Transit	Bike	Walk
	47%	30%	12%	1%	10%

Existing Site Vehicle Trips and Vehicle Trip Generation Rates (per KSF)

	Weekday												Saturday					
Trip Generation Rates by Mode	Daily	in	out	AM	in	out	MD	in	out	PM	in	out	Daily	in	out	MD	in	out
	1,904	952	952	--	--	--	459	161	298	109	24	85	2,483	1,242	1,241	426	217	209
	30.22	50%	50%	--	--	--	7.29	35%	65%	1.73	22%	78%	39.41	50%	50%	6.76	51%	49%

Existing Site Transit Trips and Transit Trip Generation Rates (per KSF)

	Weekday												Saturday					
	Daily	in	out	AM	in	out	MD	in	out	PM	in	out	Daily	in	out	MD	in	out
	486	243	243	--	--	--	117	41	76	28	6	22	634	317	317	109	56	53
	7.71	50%	50%	--	--	--	1.86	35%	65%	0.44	22%	78%	10.06	50%	50%	1.73	51%	49%

Existing Site Bike Trips and Bike Trip Generation Rates (per KSF)

	Weekday												Saturday					
	Daily	in	out	AM	in	out	MD	in	out	PM	in	out	Daily	in	out	MD	in	out
	41	21	20	--	--	--	10	4	6	2	0	2	53	27	26	9	5	4
	0.65	50%	50%	--	--	--	0.16	35%	65%	0.03	22%	78%	0.84	50%	50%	0.14	51%	49%

Existing Site Walking Trips and Walking Trip Generation Rates (per KSF)

	Weekday												Saturday					
	Daily	in	out	AM	in	out	MD	in	out	PM	in	out	Daily	in	out	MD	in	out
	405	203	202	--	--	--	98	34	64	23	5	18	528	264	264	91	46	45
	6.43	50%	50%	--	--	--	1.56	35%	65%	0.37	22%	78%	8.38	50%	50%	1.44	51%	49%

Museum Expansion Net Trip Generation (40 KSF Expansion)

	Weekday												Saturday					
Trip Type	Daily	in	out	AM	in	out	MD	in	out	PM	in	out	Daily	in	out	MD	in	out
Person	2,701	1,351	1,350	--	--	--	651	228	423	155	34	121	3,523	1,762	1,761	605	309	296
Vehicle	1,269	635	634	--	--	--	306	107	199	73	16	57	1,655	828	827	284	145	139
Transit	324	162	162	--	--	--	78	27	51	18	4	14	423	212	211	73	37	36
Bike	27	14	13	--	--	--	7	2	5	1	0	1	35	18	17	6	3	3
Walking	270	135	135	--	--	--	66	23	43	16	4	12	352	176	176	60	31	29

CLATS

Case Logging and Tracking System

Welcome **wes**! | Log Out | Profile | Admin

RELATED PROJECTS

Centroid Info:
PROJ ID: 53149
Address: 5801 W WILSHIRE BLVD
LOS ANGELES , CA 90036
Lat/Long: 34.0627, -118.355

Buffer Radius: 2640 feet

Search

Column

Include NULL "Trip info": ☐
Include NULL "FirstStudySubmittalDate" (latest) ☐
Include "Inactive" projects: ☐
Include "Do not show in Related Project": ☐
Net_AM_Trips - Select -
Net_PM_Trips - Select -
Net_Daily_Trips - Select -

Record Count: 5 | Record Per Page: All Records

Results generated since: (3/9/2022 3:17:03 PM)

Proj ID	Office	Area	CD	Year	Project Title	Project Desc	Address	First Study Submittal Date	Distance (feet)
43983	Metro	HWD	4	2016	Apartments	49 Apartments	5891 W Olympic bl	01/06/2016	2259.4
46484	Metro	HWD	4	2017	Wilshire Curson Residential Project	285 High Rise Apt	5757 W WILSHIRE BL	02/22/2018	463.4
50727	Metro	MTR	4	2020	800-840 S. Fairfax Av	181 units, 28 affordable apt, 2.653ksf restaurant	800 S Fairfax Avenue	12/16/2020	2256.4
52507	Metro	MTR	4	2021	688 Cochran Ave MU	348 Apts;38 affordable,4578SF Retail,4598KSF Rest,1KSF Cafe	688 S Cochran Ave	11/04/2021	2554.0
43865	Metro	MTR	4	2015	LACMA Renovation	Replace 392871 SF of Museum with 368300 SF	5905 W WILSHIRE BLVD	03/21/2017	1314.8

Trip Info

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Apartments	Total Units	49	25	30	326	5	20	20	10	
			25	**30**	**326**		**5**	**20**	**20**	**10**

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Apartments	Total Units	304	79	94	1198	20	59	57	37	Total net project trips
			79	**94**	**1198**		**20**	**59**	**57**	**37**

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Mixed Use	Total Units	181	73	79	775	27	46	48	31	
Other	Total Units	28								Affordable housing
Other	S.F. Gross Area	2653								High-turnover restaurant
			73	**79**	**775**		**27**	**46**	**48**	**31**

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Apartments	Total Units	310	26	-27	-81	-14	40	3	-30	Total Net Proj Trips
Other	Total Units	38								Affordable
Retail	S.F. Gross Area	4578								
Other	S.F. Gross Area	4598								Restaurant
Other	S.F. Gross Area	1000								Cafe
			26	**-27**	**-81**		**-14**	**40**	**3**	**-30**

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Other	Other		45	68	668	43	2	15	53	Weekday trips based on 750 visitors
			45	**68**	**668**		**43**	**2**	**15**	**53**

La Brea Tar Pits / Page Museum Related Cases

Missing from list:

Address: 6052 – 6022 W. Olympic Blvd.

Case: DIR-2020-3886-TOC-SPR

Project Description – Construction of a 6-story, mixed-use building containing approximately 107,640 sf of floor area, including 5,135 square feet of commercial retail space and 120 residential units, on a 28,704 square-foot site.

Address: 6300 W. 3rd Street

Case: DIR-2018-2770-SPR-WDI

Project Description: Demolition of over 150,000 sf of commercial uses and partial demolition of surface parking lot. Construction of 8-story 100-foot tall, mixed use building consisting of 83,994 sf of commercial space and 331 dwelling units for a total floor area of 426,994 sf.

Address: 650 – 676 S. San Vicente Blvd.

Case: CPC-2017-467-GPA-VZC-HD-SPR

Project Description: The Project proposes 140,305 square feet of medical office space, 4,000 square feet of restaurant/retail space, and 1,000 square feet for other commercial uses, such as a pharmacy. The Project Site is currently improved with two buildings and associated surface parking lots, comprised of a 5,738 square-foot, vacant educational building, and an 8,225 square foot Big 5 Sporting Goods store, both of which would be demolished. The proposed uses would be built within a single, 12-story, 230-foot building that includes ground floor lobby and commercial space, four levels of above-ground, podium parking, and seven levels of medical office and/or uses.

6001 – 6011 West Olympic Blvd.

Case: DIR-2019-1101-TOC

Project Description: The proposed project includes the construction, use, and maintenance of a new, 57-unit, 72-foot tall mixed-use building with 1,308 square feet of ground floor retail. The project will set aside six (6) of the 57 units for Extremely Low Income Households. The unit mix will be comprised of 16 studio units and 41 one-bedroom units. The project proposes to provide 45 automobile parking spaces (five for commercial uses and 40 for residential uses) of 68 bicycle parking spaces, including 60 long-term spaces and eight (8) short-term bicycle spaces. A total of 4,645 square feet of open space will be provided throughout the proposed project. The project also includes the export of approximately 6,000 cubic yards of earth.

Corrections to list:

- 5891 Olympic – 46 apartments not 49.

- Update 5757 Wilshire project description to: Address – 5700 -5780 Wilshire Blvd; 712-752 S. Curson Ave; 5721 -5773 W. 8th Street; 715 – 761 S. Masselin
  Case: CPC-2020-3850-ZC-HD-SPR-MCUP-CDO
  Project Description – The 382,186 square-foot (8.77-acre) Project Site is currently developed with two, six-story primarily office buildings comprising 1,002,990 square feet of floor area as well as three levels of subterranean parking beneath the two buildings. The Project would retain and renovate the southern portion of the existing buildings and would demolish the northern portion of the two existing office buildings for the addition of approximately 1,923,837 square feet of new floor area consisting of 1,806,237 square feet of office uses and 117,600 square feet of ground floor commercial space. The proposed uses would be located within two new high-rise towers ranging from 35- to 41-stories with approximate heights of 535 feet to 625 feet, respectively. A portion of the existing parking would also be removed, and the remaining parking area would be renovated. In addition, the Project would provide 2,901 new vehicular parking spaces for a total of 4,650 vehicular parking spaces. Parking would be provided within seven above-grade parking levels. The Project would also redesign the existing landscaping and open space within the Project Site to include a podium, courtyards, exterior terraces, streetscapes, and walkways to connect the proposed buildings. Upon completion, the Project would result in a net lot area of 390,092 square feet (8.9 acres) within the Project Site, with a total floor area of approximately 2,340,552 square feet comprised of 2,222,952 square feet of office floor area and 117,600 square feet of commercial floor area with a floor area ratio (FAR) of 6:1.

- Update 688 Cochran Ave description to: Address: 5411 Wilshire Blvd.
  Case: CPC-2020-3143-DB-MCUP-CDO-SPR-HCA
  Project Description: The Project consists of the construction and operation of a new 42-story mixed-use tower including up to 348 dwelling units and approximately 10,176 square feet of ground floor commercial uses. Thirty-eight of the dwelling units would be restricted affordable (29 units set aside for Very Low Income households and nine units set aside for Moderate Income households). The Project would demolish approximately 38,545 square feet of existing commercial uses. The existing commercial building at 5401 Wilshire Boulevard, a contributor to the Miracle Mile Historic District, would be demolished and two of its facades would be retained and incorporated into the new building. The new building would be 39 stories over a three-level podium, with three levels of subterranean automated parking, with a maximum height of 530 feet. The Project would include a total floor area of up to 476,777 square feet.

Appendix 2 — Peak Attendance Data

TPM GA					
	Members	Paid	Unpaid	Schools	TOTAL
Jan-17	2,319	19,526	13,906	3,239	38,990
Feb-17	2,201	21,849	4,093	4,158	32,301
Mar-17	2,138	28,588	4,981	7,814	43,521
Apr-17	2,392	33,149	5,921	6,978	48,440
May-17	1,872	23,611	4,293	8,067	37,843
Jun-17	2,383	32,274	6,422	3,152	44,231
Jul-17	3,464	47,395	6,419	970	58,248
Aug-17	2,870	36,084	5,472	603	45,029
Sep-17	2,210	20,604	6,776	1,672	31,262
Oct-17	1,564	21,831	3,829	3,420	30,644
Nov-17	2,322	23,710	4,243	3,625	33,900
Dec-17	2,197	29,217	4,609	1,381	37,404
Jan-18	2,653	19,284	21,026	3,019	45,982
Feb-18	2,311	21,556	4,603	2,850	31,320
Mar-18	2,737	30,674	6,165	5,671	45,247
Apr-18	2,552	25,493	7,911	6,967	42,923
May-18	1,861	20,008	4,430	7,213	33,512
Jun-18	3,140	27,193	8,497	2,493	41,323
Jul-18	3,467	33,251	7,980	604	45,302
Aug-18	3,261	25,668	7,302	653	36,884
Sep-18	2,398	15,940	5,985	1,253	25,576
Oct-18	1,525	14,946	3,126	2,754	22,351
Nov-18	2,315	16,382	3,739	2,707	25,143
Dec-18	3,036	21,680	4,038	1,911	30,665
Jan-19	2,774	18,482	3,925	3,559	28,740
Feb-19	2,175	16,584	8,458	4,143	31,360
Mar-19	2,585	23,510	5,422	6,526	38,043
Apr-19	2,639	23,259	6,281	5,079	37,258
May-19	2,092	17,347	3,997	7,654	31,090
Jun-19	3,491	26,719	7,738	1,976	39,924
Jul-19	4,185	35,038	8,807	1,694	49,724
Aug-19	3,773	28,251	7,084	483	39,591
Sep-19	2,844	15,449	5,741	943	24,977
Oct-19	1,603	15,285	3,659	2,564	23,111
Nov-19	2,382	17,967	4,206	4,161	28,716
Dec-19	2,646	22,732	4,357	2,131	31,866
Jan-20	2,400	17,191	12,924	2,063	34,578
Feb-20	2,350	17,712	4,127	3,734	27,923
Mar-20	417	5,614	1,895	1,157	9,083
Apr-20	-	-	-	-	-
May-20	-	-	-	-	-
Jun-20	-	-	-	-	-
Jul-20	-	-	-	-	-
Aug-20	-	-	-	-	-
Sep-20	-	-	-	-	-
Oct-20	-	-	-	-	-
Nov-20	-	-	-	-	-
Dec-20	-	-	-	-	-
Jan-21	-	-	-	-	-
Feb-21	-	-	-	-	-
Mar-21	-	-	-	-	-
Apr-21	1,779	2,487	840	7	5,113
May-21	2,713	9,232	3,798	74	15,817
Jun-21	2,038	16,263	4,908	154	23,363
Jul-21	1,947	24,688	6,303	311	33,249
Aug-21	1,349	17,084	4,757	161	23,351
Sep-21	1,402	12,159	4,167	179	17,907
Oct-21	1,337	13,929	4,065	686	20,017
Nov-21	1,088	13,632	3,690	523	18,933
Dec-21	1,021	14,928	2,913	642	19,504

Usage Time	Ticket Type	Type of Visitor	Financial Reporting Group	Zip Code
7/26/17 9:31 AM	STUDENT	PAGE STUDENT	PAID	92656
7/26/17 9:40 AM	STUDENT	PAGE STUDENT	PAID	21207
7/26/17 9:51 AM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 9:56 AM	ADULT	PAGE TEACHER	SCHOOLS	95630
7/26/17 9:46 AM	SENIOR	PAGE SENIOR	PAID	333
7/26/17 9:55 AM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 9:55 AM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 9:56 AM	SENIOR	PAGE SENIOR	PAID	95630
7/26/17 9:56 AM	SENIOR	PAGE SENIOR	PAID	95630
7/26/17 9:40 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	21207
7/26/17 9:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 9:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 9:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
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7/26/17 9:31 AM	ADULT	PAGE ADULT	PAID	92656
7/26/17 9:32 AM	ADULT	PAGE ADULT	PAID	40342
7/26/17 9:32 AM	ADULT	PAGE ADULT	PAID	40342
7/26/17 9:34 AM	ADULT	PAGE ADULT	PAID	999CN
7/26/17 9:40 AM	ADULT	PAGE ADULT	PAID	21207
7/26/17 9:40 AM	ADULT	PAGE ADULT	PAID	21207
7/26/17 9:44 AM	ADULT	PAGE ADULT	PAID	0
7/26/17 9:45 AM	ADULT	PAGE ADULT	PAID	0
7/26/17 9:51 AM	ADULT	PAGE ADULT	PAID	0
7/26/17 9:51 AM	ADULT	PAGE ADULT	PAID	0
7/26/17 9:53 AM	ADULT	PAGE ADULT	PAID	68104
7/26/17 9:56 AM	ADULT	PAGE ADULT	PAID	95630
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7/26/17 9:44 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90212
7/26/17 10:34 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	91352
7/26/17 10:45 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90048
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7/26/17 10:30 AM	Family Membership	MEMBERSHIP	MEMBERS	98383
7/26/17 10:07 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90066
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7/26/17 10:23 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90068
7/26/17 10:24 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90068
7/26/17 10:13 AM	Family Membership	MEMBERSHIP	MEMBERS	90230
7/26/17 10:42 AM	Family Membership	MEMBERSHIP	MEMBERS	91390
7/26/17 10:49 AM	Family Membership	MEMBERSHIP	MEMBERS	90280
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7/26/17 10:47 AM	ADULT	PAGE ADULT	PAID	8003
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7/26/17 10:54 AM	ADULT	PAGE ADULT	PAID	63110
7/26/17 10:58 AM	ADULT	PAGE ADULT	PAID	78505
7/26/17 10:58 AM	ADULT	PAGE ADULT	PAID	99eU'
7/26/17 10:58 AM	ADULT	PAGE ADULT	PAID	99eU'
7/26/17 10:59 AM	ADULT	PAGE ADULT	PAID	22
7/26/17 10:59 AM	ADULT	PAGE ADULT	PAID	22
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7/26/17 10:55 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93953
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7/26/17 10:59 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 10:03 AM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 10:03 AM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 10:34 AM	SENIOR	PAGE SENIOR	PAID	999fr
7/26/17 10:40 AM	SENIOR	PAGE SENIOR	PAID	0
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7/26/17 10:51 AM	SENIOR	PAGE SENIOR	PAID	91505
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7/26/17 10:58 AM	SENIOR	PAGE SENIOR	PAID	93312
7/26/17 10:06 AM	ADULT	PAGE TEACHER	SCHOOLS	95762
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7/26/17 10:55 AM	ADULT	PAGE TEACHER	SCHOOLS	93953

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7/26/17 10:41 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	98271
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7/26/17 10:28 AM	STUDENT	PAGE STUDENT	PAID	0
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7/26/17 10:11 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	33180
7/26/17 10:41 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	93725
7/26/17 10:41 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	93725
7/26/17 10:41 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	93725
7/26/17 10:57 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	0
7/26/17 10:51 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91505
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7/26/17 10:11 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	33180
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7/26/17 10:18 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	22701
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7/26/17 10:41 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	93725
7/26/17 10:41 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	93725
7/26/17 10:57 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 10:57 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 10:57 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 10:06 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	95762
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7/26/17 10:37 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92571
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7/26/17 10:36 AM	EBT Adult	Page EBT Adult	UNPAID	90037
7/26/17 10:36 AM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90037
7/26/17 10:36 AM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90037
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7/26/17 10:54 AM	ADULT	PAGE GROUP ADULT	PAID	90033
7/26/17 10:20 AM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90067
7/26/17 10:20 AM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90067
7/26/17 10:20 AM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90067
7/26/17 10:20 AM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90067
7/26/17 11:02 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	60613

7/26/17 11:02 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	60613
7/26/17 11:13 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	58401
7/26/17 11:13 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	58401
7/26/17 11:19 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	92649
7/26/17 11:19 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	92649
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7/26/17 11:20 AM	TarPits Child Admission (2-Under)	PAGE ADULT WEB ND	PAID	92649
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7/26/17 11:20 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
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7/26/17 11:20 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/26/17 11:20 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/26/17 11:20 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/26/17 11:01 AM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	0
7/26/17 11:44 AM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	111
7/26/17 11:49 AM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	111
7/26/17 11:02 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	60613
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7/26/17 11:12 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	58401
7/26/17 11:12 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	58401
7/26/17 11:12 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	58401
7/26/17 11:19 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92649
7/26/17 11:19 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92649
7/26/17 11:19 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92649
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7/26/17 11:40 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	77316
7/26/17 11:47 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91355
7/26/17 11:53 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	94587
7/26/17 11:00 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91320
7/26/17 11:00 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91320
7/26/17 11:00 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91320
7/26/17 11:00 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91320
7/26/17 11:03 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	93021
7/26/17 11:24 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91201
7/26/17 11:49 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	94597
7/26/17 11:49 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	94597
7/26/17 11:18 AM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 11:18 AM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 11:18 AM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/26/17 11:18 AM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/26/17 11:01 AM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 11:04 AM	STUDENT	PAGE STUDENT	PAID	2138
7/26/17 11:10 AM	STUDENT	PAGE STUDENT	PAID	90205
7/26/17 11:10 AM	STUDENT	PAGE STUDENT	PAID	90205
7/26/17 11:14 AM	STUDENT	PAGE STUDENT	PAID	92223
7/26/17 11:14 AM	STUDENT	PAGE STUDENT	PAID	91301
7/26/17 11:17 AM	STUDENT	PAGE STUDENT	PAID	92075
7/26/17 11:17 AM	STUDENT	PAGE STUDENT	PAID	92075
7/26/17 11:17 AM	STUDENT	PAGE STUDENT	PAID	92075
7/26/17 11:25 AM	STUDENT	PAGE STUDENT	PAID	90024
7/26/17 11:27 AM	STUDENT	PAGE STUDENT	PAID	91304
7/26/17 11:28 AM	STUDENT	PAGE STUDENT	PAID	90029
7/26/17 11:28 AM	STUDENT	PAGE STUDENT	PAID	90029
7/26/17 11:29 AM	STUDENT	PAGE STUDENT	PAID	94501

7/26/17 11:37 AM	STUDENT	PAGE STUDENT	PAID	93960
7/26/17 11:41 AM	STUDENT	PAGE STUDENT	PAID	90043
7/26/17 11:51 AM	STUDENT	PAGE STUDENT	PAID	92373
7/26/17 11:53 AM	STUDENT	PAGE STUDENT	PAID	30041
7/26/17 11:53 AM	STUDENT	PAGE STUDENT	PAID	92325
7/26/17 11:57 AM	STUDENT	PAGE STUDENT	PAID	91743
7/26/17 11:57 AM	STUDENT	PAGE STUDENT	PAID	91743
7/26/17 11:57 AM	STUDENT	PAGE STUDENT	PAID	95821
7/26/17 11:57 AM	STUDENT	PAGE STUDENT	PAID	95821
7/26/17 11:03 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	93021
7/26/17 11:04 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90291
7/26/17 11:05 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/26/17 11:06 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90712
7/26/17 11:14 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/26/17 11:14 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/26/17 11:16 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90066
7/26/17 11:51 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90044
7/26/17 11:00 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91320
7/26/17 11:00 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91320
7/26/17 11:03 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93021
7/26/17 11:24 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91201
7/26/17 11:24 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	55447
7/26/17 11:24 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	55447
7/26/17 11:43 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91307
7/26/17 11:49 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	94597
7/26/17 11:51 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90044
7/26/17 11:14 AM	ADULT	PAGE TEACHER	SCHOOLS	92223
7/26/17 11:16 AM	ADULT	PAGE TEACHER	SCHOOLS	90066
7/26/17 11:20 AM	ADULT	PAGE TEACHER	SCHOOLS	93063
7/26/17 11:55 AM	ADULT	PAGE TEACHER	SCHOOLS	22
7/26/17 11:00 AM	SENIOR	PAGE SENIOR	PAID	22
7/26/17 11:04 AM	SENIOR	PAGE SENIOR	PAID	90291
7/26/17 11:04 AM	SENIOR	PAGE SENIOR	PAID	90291
7/26/17 11:04 AM	SENIOR	PAGE SENIOR	PAID	24421
7/26/17 11:05 AM	SENIOR	PAGE SENIOR	PAID	24421
7/26/17 11:06 AM	SENIOR	PAGE SENIOR	PAID	89702
7/26/17 11:07 AM	SENIOR	PAGE SENIOR	PAID	91730
7/26/17 11:09 AM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 11:09 AM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 11:10 AM	SENIOR	PAGE SENIOR	PAID	90205
7/26/17 11:10 AM	SENIOR	PAGE SENIOR	PAID	90205
7/26/17 11:12 AM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 11:14 AM	SENIOR	PAGE SENIOR	PAID	91301
7/26/17 11:14 AM	SENIOR	PAGE SENIOR	PAID	91301
7/26/17 11:17 AM	SENIOR	PAGE SENIOR	PAID	20147
7/26/17 11:17 AM	SENIOR	PAGE SENIOR	PAID	92075
7/26/17 11:17 AM	SENIOR	PAGE SENIOR	PAID	92075
7/26/17 11:20 AM	SENIOR	PAGE SENIOR	PAID	93063
7/26/17 11:25 AM	SENIOR	PAGE SENIOR	PAID	90024
7/26/17 11:30 AM	SENIOR	PAGE SENIOR	PAID	70117
7/26/17 11:31 AM	SENIOR	PAGE SENIOR	PAID	91761
7/26/17 11:41 AM	SENIOR	PAGE SENIOR	PAID	89119
7/26/17 11:41 AM	SENIOR	PAGE SENIOR	PAID	89119
7/26/17 11:45 AM	SENIOR	PAGE SENIOR	PAID	85704
7/26/17 11:45 AM	SENIOR	PAGE SENIOR	PAID	85704
7/26/17 11:49 AM	SENIOR	PAGE SENIOR	PAID	22
7/26/17 11:49 AM	SENIOR	PAGE SENIOR	PAID	22
7/26/17 11:51 AM	SENIOR	PAGE SENIOR	PAID	92373
7/26/17 11:51 AM	SENIOR	PAGE SENIOR	PAID	92373
7/26/17 11:53 AM	SENIOR	PAGE SENIOR	PAID	92404
7/26/17 11:54 AM	SENIOR	PAGE SENIOR	PAID	13608
7/26/17 11:54 AM	SENIOR	PAGE SENIOR	PAID	13608

7/26/17 11:58 AM	SENIOR	PAGE SENIOR	PAID	111
7/26/17 11:01 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	29301
7/26/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	29301
7/26/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	29301
7/26/17 11:03 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91423
7/26/17 11:04 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	2138
7/26/17 11:04 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90291
7/26/17 11:04 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90291
7/26/17 11:04 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90291
7/26/17 11:05 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 11:06 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90712
7/26/17 11:06 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	89403
7/26/17 11:06 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	89403
7/26/17 11:12 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 11:14 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 11:15 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	61705
7/26/17 11:16 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 11:16 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92075
7/26/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92075
7/26/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92075
7/26/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92075
7/26/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92075
7/26/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92075
7/26/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90036
7/26/17 11:20 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93063
7/26/17 11:27 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91304
7/26/17 11:27 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	75218
7/26/17 11:28 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90049
7/26/17 11:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	29651
7/26/17 11:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	29651
7/26/17 11:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	29651
7/26/17 11:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91761
7/26/17 11:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91761
7/26/17 11:32 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91325
7/26/17 11:35 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92056
7/26/17 11:35 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92056
7/26/17 11:35 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92056
7/26/17 11:37 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93960
7/26/17 11:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90026
7/26/17 11:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	89123
7/26/17 11:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	89123
7/26/17 11:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91604
7/26/17 11:40 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	77316
7/26/17 11:40 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	77316
7/26/17 11:43 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91307
7/26/17 11:43 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91307
7/26/17 11:45 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85704
7/26/17 11:47 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91355
7/26/17 11:47 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91355
7/26/17 11:48 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 11:49 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90744
7/26/17 11:49 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90744
7/26/17 11:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90044
7/26/17 11:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92020
7/26/17 11:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92020
7/26/17 11:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92020
7/26/17 11:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92373
7/26/17 11:53 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94587
7/26/17 11:53 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94587
7/26/17 11:55 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22

7/26/17 11:58 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	111
7/26/17 11:01 AM	ADULT	PAGE ADULT	PAID	90047
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7/26/17 11:01 AM	ADULT	PAGE ADULT	PAID	0
7/26/17 11:02 AM	ADULT	PAGE ADULT	PAID	29301
7/26/17 11:02 AM	ADULT	PAGE ADULT	PAID	29301
7/26/17 11:03 AM	ADULT	PAGE ADULT	PAID	54004
7/26/17 11:03 AM	ADULT	PAGE ADULT	PAID	54004
7/26/17 11:03 AM	ADULT	PAGE ADULT	PAID	54004
7/26/17 11:03 AM	ADULT	PAGE ADULT	PAID	91423
7/26/17 11:04 AM	ADULT	PAGE ADULT	PAID	90291
7/26/17 11:04 AM	ADULT	PAGE ADULT	PAID	90291
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7/26/17 11:05 AM	ADULT	PAGE ADULT	PAID	0
7/26/17 11:06 AM	ADULT	PAGE ADULT	PAID	90712
7/26/17 11:06 AM	ADULT	PAGE ADULT	PAID	89403
7/26/17 11:07 AM	ADULT	PAGE ADULT	PAID	91730
7/26/17 11:13 AM	ADULT	PAGE ADULT	PAID	999CA
7/26/17 11:13 AM	ADULT	PAGE ADULT	PAID	999CA
7/26/17 11:14 AM	ADULT	PAGE ADULT	PAID	92223
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7/26/17 11:15 AM	ADULT	PAGE ADULT	PAID	61705
7/26/17 11:15 AM	ADULT	PAGE ADULT	PAID	61705
7/26/17 11:16 AM	ADULT	PAGE ADULT	PAID	0
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7/26/17 11:17 AM	ADULT	PAGE ADULT	PAID	92075
7/26/17 11:17 AM	ADULT	PAGE ADULT	PAID	92075
7/26/17 11:23 AM	ADULT	PAGE ADULT	PAID	999AU
7/26/17 11:23 AM	ADULT	PAGE ADULT	PAID	999AU
7/26/17 11:27 AM	ADULT	PAGE ADULT	PAID	91304
7/26/17 11:27 AM	ADULT	PAGE ADULT	PAID	75218
7/26/17 11:27 AM	ADULT	PAGE ADULT	PAID	75218
7/26/17 11:28 AM	ADULT	PAGE ADULT	PAID	90049
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7/26/17 11:29 AM	ADULT	PAGE ADULT	PAID	94501
7/26/17 11:30 AM	ADULT	PAGE ADULT	PAID	19041
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7/26/17 11:30 AM	ADULT	PAGE ADULT	PAID	70117
7/26/17 11:31 AM	ADULT	PAGE ADULT	PAID	29651
7/26/17 11:31 AM	ADULT	PAGE ADULT	PAID	29651
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7/26/17 11:32 AM	ADULT	PAGE ADULT	PAID	91325
7/26/17 11:35 AM	ADULT	PAGE ADULT	PAID	92056
7/26/17 11:35 AM	ADULT	PAGE ADULT	PAID	92056
7/26/17 11:35 AM	ADULT	PAGE ADULT	PAID	2301
7/26/17 11:37 AM	ADULT	PAGE ADULT	PAID	93960
7/26/17 11:37 AM	ADULT	PAGE ADULT	PAID	93960
7/26/17 11:39 AM	ADULT	PAGE ADULT	PAID	90026
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7/26/17 11:39 AM	ADULT	PAGE ADULT	PAID	89123
7/26/17 11:39 AM	ADULT	PAGE ADULT	PAID	91604
7/26/17 11:43 AM	ADULT	PAGE ADULT	PAID	91307
7/26/17 11:45 AM	ADULT	PAGE ADULT	PAID	89148
7/26/17 11:45 AM	ADULT	PAGE ADULT	PAID	89148
7/26/17 11:48 AM	ADULT	PAGE ADULT	PAID	22
7/26/17 11:49 AM	ADULT	PAGE ADULT	PAID	90744
7/26/17 11:49 AM	ADULT	PAGE ADULT	PAID	90744
7/26/17 11:49 AM	ADULT	PAGE ADULT	PAID	999au
7/26/17 11:51 AM	ADULT	PAGE ADULT	PAID	13350

7/26/17 11:51 AM	ADULT	PAGE ADULT	PAID	13350
7/26/17 11:51 AM	ADULT	PAGE ADULT	PAID	13350
7/26/17 11:51 AM	ADULT	PAGE ADULT	PAID	92020
7/26/17 11:51 AM	ADULT	PAGE ADULT	PAID	92020
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7/26/17 11:53 AM	ADULT	PAGE ADULT	PAID	30041
7/26/17 11:53 AM	ADULT	PAGE ADULT	PAID	94587
7/26/17 11:53 AM	ADULT	PAGE ADULT	PAID	94587
7/26/17 11:57 AM	ADULT	PAGE ADULT	PAID	95821
7/26/17 11:58 AM	ADULT	PAGE ADULT	PAID	80526
7/26/17 11:58 AM	ADULT	PAGE ADULT	PAID	80526
7/26/17 11:52 AM	Complimentary Admission	NHM/PAGE COMP TICKET	UNPAID	90007
7/26/17 11:36 AM	Family Membership	MEMBERSHIP	MEMBERS	90036
7/26/17 11:24 AM	Dual Membership Plus	MEMBERSHIP	MEMBERS	90212
7/26/17 11:14 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90048
7/26/17 11:24 AM	Dual Membership Plus	MEMBERSHIP	MEMBERS	90212
7/26/17 11:46 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90045
7/26/17 12:55 PM	Family Membership Plus	MEMBERSHIP	MEMBERS	
7/26/17 12:37 PM	Family Membership	MEMBERSHIP	MEMBERS	90025
7/26/17 12:58 PM	Family Membership	MEMBERSHIP	MEMBERS	90601
7/26/17 12:05 PM	Individual	MEMBERSHIP	MEMBERS	90712
7/26/17 12:19 PM	Dual Membership	MEMBERSHIP	MEMBERS	90034
7/26/17 12:07 PM	Family Membership Plus	MEMBERSHIP	MEMBERS	92399
7/26/17 12:04 PM	ADULT	PAGE ADULT	PAID	999eu
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7/26/17 12:05 PM	ADULT	PAGE ADULT	PAID	87111
7/26/17 12:05 PM	ADULT	PAGE ADULT	PAID	87111
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7/26/17 12:06 PM	ADULT	PAGE ADULT	PAID	90265
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7/26/17 12:21 PM	ADULT	PAGE ADULT	PAID	92307
7/26/17 12:21 PM	ADULT	PAGE ADULT	PAID	92307
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7/26/17 12:28 PM	ADULT	PAGE ADULT	PAID	93015
7/26/17 12:28 PM	ADULT	PAGE ADULT	PAID	93015
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7/26/17 12:28 PM	ADULT	PAGE ADULT	PAID	22
7/26/17 12:29 PM	ADULT	PAGE ADULT	PAID	90064

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7/26/17 12:32 PM	ADULT	PAGE ADULT	PAID	92354
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7/26/17 12:35 PM	ADULT	PAGE ADULT	PAID	999Ch
7/26/17 12:35 PM	ADULT	PAGE ADULT	PAID	999Ch
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7/26/17 12:37 PM	ADULT	PAGE ADULT	PAID	222
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7/26/17 12:38 PM	ADULT	PAGE ADULT	PAID	222
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7/26/17 12:41 PM	ADULT	PAGE ADULT	PAID	92129
7/26/17 12:42 PM	ADULT	PAGE ADULT	PAID	92130
7/26/17 12:42 PM	ADULT	PAGE ADULT	PAID	92130
7/26/17 12:42 PM	ADULT	PAGE ADULT	PAID	90403
7/26/17 12:42 PM	ADULT	PAGE ADULT	PAID	999UK
7/26/17 12:42 PM	ADULT	PAGE ADULT	PAID	999UK
7/26/17 12:43 PM	ADULT	PAGE ADULT	PAID	999Eu
7/26/17 12:43 PM	ADULT	PAGE ADULT	PAID	999Eu
7/26/17 12:43 PM	ADULT	PAGE ADULT	PAID	999Eu
7/26/17 12:44 PM	ADULT	PAGE ADULT	PAID	0
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7/26/17 12:46 PM	ADULT	PAGE ADULT	PAID	999uk
7/26/17 12:47 PM	ADULT	PAGE ADULT	PAID	222
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7/26/17 12:48 PM	ADULT	PAGE ADULT	PAID	0
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7/26/17 12:50 PM	ADULT	PAGE ADULT	PAID	75300
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7/26/17 12:51 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 12:51 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 12:51 PM	ADULT	PAGE ADULT	PAID	76167
7/26/17 12:51 PM	ADULT	PAGE ADULT	PAID	76167
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7/26/17 12:53 PM	ADULT	PAGE ADULT	PAID	91423
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7/26/17 12:56 PM	ADULT	PAGE ADULT	PAID	91602
7/26/17 12:57 PM	ADULT	PAGE ADULT	PAID	999ko
7/26/17 12:58 PM	ADULT	PAGE ADULT	PAID	999ko
7/26/17 12:59 PM	ADULT	PAGE ADULT	PAID	0
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7/26/17 12:00 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91602
7/26/17 12:00 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91602
7/26/17 12:00 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 12:00 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 12:04 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 12:04 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
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7/26/17 12:06 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90265
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7/26/17 12:11 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98002
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7/26/17 12:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
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7/26/17 12:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 12:13 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90066
7/26/17 12:13 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90045
7/26/17 12:13 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90045
7/26/17 12:13 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90045
7/26/17 12:13 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90045
7/26/17 12:21 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92307
7/26/17 12:21 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92307
7/26/17 12:28 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 12:28 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 12:30 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 12:30 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 12:30 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 12:35 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	111
7/26/17 12:37 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/26/17 12:37 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91789
7/26/17 12:38 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
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7/26/17 12:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	86401
7/26/17 12:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	86401
7/26/17 12:41 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92129
7/26/17 12:41 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92129
7/26/17 12:41 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92129
7/26/17 12:42 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92130
7/26/17 12:42 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92130
7/26/17 12:42 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92130
7/26/17 12:42 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90403
7/26/17 12:43 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999Eu
7/26/17 12:44 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91790
7/26/17 12:44 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91790
7/26/17 12:44 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90563
7/26/17 12:44 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90563
7/26/17 12:46 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999uk
7/26/17 12:46 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999uk
7/26/17 12:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/26/17 12:48 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 12:48 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 12:48 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
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7/26/17 12:50 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	75300
7/26/17 12:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 12:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 12:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	76167
7/26/17 12:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	76167
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7/26/17 12:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	76167
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7/26/17 12:58 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999ko
7/26/17 12:58 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999ko

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7/26/17 12:59 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
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7/26/17 12:00 PM	SENIOR	PAGE SENIOR	PAID	91602
7/26/17 12:02 PM	SENIOR	PAGE SENIOR	PAID	92509
7/26/17 12:03 PM	SENIOR	PAGE SENIOR	PAID	35068
7/26/17 12:04 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 12:04 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 12:06 PM	SENIOR	PAGE SENIOR	PAID	90024
7/26/17 12:18 PM	SENIOR	PAGE SENIOR	PAID	98036
7/26/17 12:18 PM	SENIOR	PAGE SENIOR	PAID	98036
7/26/17 12:28 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 12:28 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 12:32 PM	SENIOR	PAGE SENIOR	PAID	11
7/26/17 12:35 PM	SENIOR	PAGE SENIOR	PAID	93036
7/26/17 12:35 PM	SENIOR	PAGE SENIOR	PAID	111
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7/26/17 12:40 PM	SENIOR	PAGE SENIOR	PAID	86401
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7/26/17 12:56 PM	SENIOR	PAGE SENIOR	PAID	91602
7/26/17 12:00 PM	ADULT	PAGE TEACHER	SCHOOLS	22
7/26/17 12:02 PM	ADULT	PAGE TEACHER	SCHOOLS	92509
7/26/17 12:06 PM	ADULT	PAGE TEACHER	SCHOOLS	90024
7/26/17 12:12 PM	ADULT	PAGE TEACHER	SCHOOLS	0
7/26/17 12:13 PM	ADULT	PAGE TEACHER	SCHOOLS	90045
7/26/17 12:28 PM	ADULT	PAGE TEACHER	SCHOOLS	22
7/26/17 12:39 PM	ADULT	PAGE TEACHER	SCHOOLS	0
7/26/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	63129
7/26/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	63129
7/26/17 12:15 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92117
7/26/17 12:15 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92117
7/26/17 12:29 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	98370
7/26/17 12:29 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	98370
7/26/17 12:13 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90066
7/26/17 12:28 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/26/17 12:43 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	999Eu
7/26/17 12:46 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	999uk
7/26/17 12:02 PM	STUDENT	PAGE STUDENT	PAID	90065
7/26/17 12:04 PM	STUDENT	PAGE STUDENT	PAID	35068
7/26/17 12:04 PM	STUDENT	PAGE STUDENT	PAID	0
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7/26/17 12:35 PM	STUDENT	PAGE STUDENT	PAID	999Ch
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7/26/17 12:35 PM	STUDENT	PAGE STUDENT	PAID	111
7/26/17 12:36 PM	STUDENT	PAGE STUDENT	PAID	1111
7/26/17 12:40 PM	STUDENT	PAGE STUDENT	PAID	86401
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7/26/17 12:42 PM	STUDENT	PAGE STUDENT	PAID	999UK
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7/26/17 12:42 PM	STUDENT	PAGE STUDENT	PAID	999UK
7/26/17 12:44 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 12:45 PM	STUDENT	PAGE STUDENT	PAID	10305
7/26/17 12:45 PM	STUDENT	PAGE STUDENT	PAID	10305

7/26/17 12:45 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 12:18 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/26/17 12:18 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/26/17 12:19 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/26/17 12:19 PM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 12:19 PM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 12:40 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	111
7/26/17 12:40 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	111
7/26/17 12:19 PM	Tar Pits Admission Child 2-Under	GC TP GROUP CH 2 UNDER	PAID	
7/26/17 12:04 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	63129
7/26/17 12:04 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	63129
7/26/17 12:29 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	98370
7/26/17 12:29 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	98370
7/26/17 12:29 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	98370
7/26/17 12:20 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	0
7/26/17 12:30 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	22
7/26/17 12:39 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	0
7/26/17 12:40 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	111
7/26/17 12:40 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	111
7/26/17 12:37 PM	EBT Adult	Page EBT Adult	UNPAID	90045
7/26/17 12:37 PM	EBT Adult	Page EBT Adult	UNPAID	90045
7/26/17 12:49 PM	EBT Adult	Page EBT Adult	UNPAID	90026
7/26/17 12:37 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90045
7/26/17 12:37 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90045
7/26/17 12:49 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90026
7/26/17 12:49 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90026
7/26/17 12:08 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	85715
7/26/17 12:20 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92691
7/26/17 12:20 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92691
7/26/17 12:48 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	93012
7/26/17 12:03 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	111
7/26/17 12:08 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	85715
7/26/17 12:20 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	92691
7/26/17 12:48 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	93012
7/26/17 12:08 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	85715
7/26/17 12:20 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	92691
7/26/17 12:20 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	92691
7/26/17 12:48 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	93012
7/26/17 12:20 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	92691
7/26/17 12:55 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90604
7/26/17 12:55 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90604
7/26/17 12:55 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90604
7/26/17 1:19 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	92083
7/26/17 1:19 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	92083
7/26/17 1:10 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	91748
7/26/17 1:10 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	91748
7/26/17 1:16 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	0
7/26/17 1:46 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	0
7/26/17 1:51 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	0
7/26/17 1:15 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	91024
7/26/17 1:19 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92083
7/26/17 1:08 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90003
7/26/17 1:08 PM	EBT Adult	Page EBT Adult	UNPAID	90003
7/26/17 1:17 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	91024
7/26/17 1:28 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 1:28 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 1:28 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 1:02 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	0
7/26/17 1:02 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	0
7/26/17 1:20 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	34210
7/26/17 1:21 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	0
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7/26/17 1:55 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92309
7/26/17 1:21 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	33180
7/26/17 1:21 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	33180
7/26/17 1:34 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	92801
7/26/17 1:59 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	4554
7/26/17 1:26 PM	Tar Pits Admission Senior	GC TP GROUP SENIOR	PAID	
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7/26/17 1:28 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	222
7/26/17 1:27 PM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 1:27 PM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 1:35 PM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 1:36 PM	Tar Pits Admission Child 3-12	GC TP GROUP CH 3-12	PAID	
7/26/17 1:35 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/26/17 1:35 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
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7/26/17 1:09 PM	STUDENT	PAGE STUDENT	PAID	94530
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7/26/17 1:19 PM	STUDENT	PAGE STUDENT	PAID	76502
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7/26/17 1:48 PM	STUDENT	PAGE STUDENT	PAID	95949
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7/26/17 1:58 PM	STUDENT	PAGE STUDENT	PAID	999Eu
7/26/17 1:59 PM	STUDENT	PAGE STUDENT	PAID	37931
7/26/17 1:04 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	92840
7/26/17 1:49 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	1985
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7/26/17 1:24 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	10012
7/26/17 1:34 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92801
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7/26/17 1:38 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90291
7/26/17 1:59 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	4554
7/26/17 1:59 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	4554
7/26/17 1:12 PM	ADULT	PAGE TEACHER	SCHOOLS	32578

7/26/17 1:12 PM	ADULT	PAGE TEACHER	SCHOOLS	32578
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7/26/17 1:55 PM	ADULT	PAGE TEACHER	SCHOOLS	92309
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7/26/17 1:02 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 1:05 PM	SENIOR	PAGE SENIOR	PAID	91748
7/26/17 1:05 PM	SENIOR	PAGE SENIOR	PAID	91748
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7/26/17 1:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90043
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7/26/17 2:19 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	73099
7/26/17 2:21 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	10580
7/26/17 2:22 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94535
7/26/17 2:23 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90731
7/26/17 2:24 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 2:28 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92614
7/26/17 2:28 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92614
7/26/17 2:32 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	76131
7/26/17 2:32 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98011
7/26/17 2:32 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98011
7/26/17 2:42 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91744
7/26/17 2:48 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	20007
7/26/17 2:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 2:51 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 2:56 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92672
7/26/17 2:58 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91367
7/26/17 2:59 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91325
7/26/17 2:59 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91325
7/26/17 2:04 PM	SENIOR	PAGE SENIOR	PAID	95624
7/26/17 2:04 PM	SENIOR	PAGE SENIOR	PAID	95624

7/26/17 2:10 PM	SENIOR	PAGE SENIOR	PAID	96034
7/26/17 2:10 PM	SENIOR	PAGE SENIOR	PAID	96034
7/26/17 2:12 PM	SENIOR	PAGE SENIOR	PAID	91773
7/26/17 2:12 PM	SENIOR	PAGE SENIOR	PAID	91773
7/26/17 2:43 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 2:47 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 2:47 PM	SENIOR	PAGE SENIOR	PAID	0
7/26/17 2:59 PM	SENIOR	PAGE SENIOR	PAID	91325
7/26/17 2:15 PM	ADULT	PAGE TEACHER	SCHOOLS	90803
7/26/17 2:58 PM	ADULT	PAGE TEACHER	SCHOOLS	91367
7/26/17 2:58 PM	ADULT	PAGE TEACHER	SCHOOLS	91367
7/26/17 2:12 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90007
7/26/17 2:39 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	2461
7/26/17 2:39 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	2461
7/26/17 2:03 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90048
7/26/17 2:32 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	76131
7/26/17 2:46 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/26/17 2:58 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91367
7/26/17 2:58 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91367
7/26/17 2:59 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91325
7/26/17 2:04 PM	STUDENT	PAGE STUDENT	PAID	22
7/26/17 2:04 PM	STUDENT	PAGE STUDENT	PAID	92129
7/26/17 2:06 PM	STUDENT	PAGE STUDENT	PAID	999mx
7/26/17 2:07 PM	STUDENT	PAGE STUDENT	PAID	999mx
7/26/17 2:12 PM	STUDENT	PAGE STUDENT	PAID	90007
7/26/17 2:16 PM	STUDENT	PAGE STUDENT	PAID	46373
7/26/17 2:19 PM	STUDENT	PAGE STUDENT	PAID	73099
7/26/17 2:21 PM	STUDENT	PAGE STUDENT	PAID	999uk
7/26/17 2:21 PM	STUDENT	PAGE STUDENT	PAID	999uk
7/26/17 2:21 PM	STUDENT	PAGE STUDENT	PAID	999uk
7/26/17 2:24 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 2:31 PM	STUDENT	PAGE STUDENT	PAID	999FR
7/26/17 2:31 PM	STUDENT	PAGE STUDENT	PAID	999FR
7/26/17 2:35 PM	STUDENT	PAGE STUDENT	PAID	90038
7/26/17 2:42 PM	STUDENT	PAGE STUDENT	PAID	91744
7/26/17 2:42 PM	STUDENT	PAGE STUDENT	PAID	91744
7/26/17 2:42 PM	STUDENT	PAGE STUDENT	PAID	91744
7/26/17 2:43 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 2:44 PM	STUDENT	PAGE STUDENT	PAID	94583
7/26/17 2:47 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 2:50 PM	STUDENT	PAGE STUDENT	PAID	90247
7/26/17 2:50 PM	STUDENT	PAGE STUDENT	PAID	90247
7/26/17 2:50 PM	STUDENT	PAGE STUDENT	PAID	90247
7/26/17 2:50 PM	STUDENT	PAGE STUDENT	PAID	90247
7/26/17 2:50 PM	STUDENT	PAGE STUDENT	PAID	90247
7/26/17 2:50 PM	STUDENT	PAGE STUDENT	PAID	90247
7/26/17 2:51 PM	STUDENT	PAGE STUDENT	PAID	91706
7/26/17 2:51 PM	STUDENT	PAGE STUDENT	PAID	91706
7/26/17 2:51 PM	STUDENT	PAGE STUDENT	PAID	91706
7/26/17 2:51 PM	STUDENT	PAGE STUDENT	PAID	85764
7/26/17 2:39 PM	ADULT	PAGE COMBO ADULT	PAID	999mx
7/26/17 2:39 PM	ADULT	PAGE COMBO ADULT	PAID	999mx
7/26/17 2:39 PM	ADULT	PAGE COMBO ADULT	PAID	999mx
7/26/17 2:03 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	95624
7/26/17 2:22 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	94535
7/26/17 2:32 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	76131
7/26/17 2:42 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91744
7/26/17 2:55 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 2:55 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 2:56 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 2:02 PM	EBT Adult	Page EBT Adult	UNPAID	92392
7/26/17 2:02 PM	EBT Adult	Page EBT Adult	UNPAID	92392

7/26/17 2:47 PM	EBT Adult	Page EBT Adult	UNPAID	90011
7/26/17 2:47 PM	EBT Adult	Page EBT Adult	UNPAID	90011
7/26/17 2:02 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	92392
7/26/17 2:02 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	92392
7/26/17 2:02 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	92392
7/26/17 2:02 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	92392
7/26/17 2:47 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90011
7/26/17 2:47 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90011
7/26/17 2:20 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	19118
7/26/17 2:20 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	19118
7/26/17 2:20 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	19118
7/26/17 2:40 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	99709
7/26/17 3:04 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 3:04 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/26/17 3:28 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	64034
7/26/17 3:28 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	64034
7/26/17 3:12 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92562
7/26/17 3:14 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	13203
7/26/17 3:28 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	64034
7/26/17 3:28 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	64034
7/26/17 3:36 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	0
7/26/17 3:01 PM	STUDENT	PAGE STUDENT	PAID	78133
7/26/17 3:01 PM	STUDENT	PAGE STUDENT	PAID	78133
7/26/17 3:01 PM	STUDENT	PAGE STUDENT	PAID	78133
7/26/17 3:08 PM	STUDENT	PAGE STUDENT	PAID	999ch
7/26/17 3:08 PM	STUDENT	PAGE STUDENT	PAID	999ch
7/26/17 3:08 PM	STUDENT	PAGE STUDENT	PAID	999ch
7/26/17 3:11 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 3:12 PM	STUDENT	PAGE STUDENT	PAID	92562
7/26/17 3:21 PM	STUDENT	PAGE STUDENT	PAID	94618
7/26/17 3:21 PM	STUDENT	PAGE STUDENT	PAID	94618
7/26/17 3:21 PM	STUDENT	PAGE STUDENT	PAID	999br
7/26/17 3:25 PM	STUDENT	PAGE STUDENT	PAID	999CH
7/26/17 3:26 PM	STUDENT	PAGE STUDENT	PAID	91732
7/26/17 3:26 PM	STUDENT	PAGE STUDENT	PAID	91732
7/26/17 3:34 PM	STUDENT	PAGE STUDENT	PAID	77377
7/26/17 3:34 PM	STUDENT	PAGE STUDENT	PAID	77377
7/26/17 3:38 PM	STUDENT	PAGE STUDENT	PAID	308
7/26/17 3:40 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 3:40 PM	STUDENT	PAGE STUDENT	PAID	0
7/26/17 3:44 PM	STUDENT	PAGE STUDENT	PAID	55424
7/26/17 3:44 PM	STUDENT	PAGE STUDENT	PAID	70015
7/26/17 3:58 PM	STUDENT	PAGE STUDENT	PAID	999AS
7/26/17 3:58 PM	STUDENT	PAGE STUDENT	PAID	999AS
7/26/17 3:58 PM	STUDENT	PAGE STUDENT	PAID	999AS
7/26/17 3:11 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	92831
7/26/17 3:16 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	33132
7/26/17 3:36 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/26/17 3:36 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 3:36 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 3:40 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90034
7/26/17 3:09 PM	SENIOR	PAGE SENIOR	PAID	999cn
7/26/17 3:09 PM	SENIOR	PAGE SENIOR	PAID	999cn
7/26/17 3:27 PM	SENIOR	PAGE SENIOR	PAID	89134
7/26/17 3:27 PM	SENIOR	PAGE SENIOR	PAID	89134
7/26/17 3:38 PM	SENIOR	PAGE SENIOR	PAID	308
7/26/17 3:01 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	78133
7/26/17 3:08 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999ch
7/26/17 3:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92562
7/26/17 3:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92562
7/26/17 3:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92562
7/26/17 3:15 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	75214

7/26/17 3:15 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	75214
7/26/17 3:16 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	33132
7/26/17 3:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/26/17 3:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/26/17 3:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/26/17 3:18 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	84009
7/26/17 3:18 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	84009
7/26/17 3:18 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	84009
7/26/17 3:21 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999br
7/26/17 3:26 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	66062
7/26/17 3:28 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 3:28 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/26/17 3:31 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	32433
7/26/17 3:34 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	77377
7/26/17 3:34 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	77377
7/26/17 3:55 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90713
7/26/17 3:55 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90713
7/26/17 3:55 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90713
7/26/17 3:55 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90713
7/26/17 3:55 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90713
7/26/17 3:01 PM	ADULT	PAGE ADULT	PAID	78133
7/26/17 3:04 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:04 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:04 PM	ADULT	PAGE ADULT	PAID	22
7/26/17 3:05 PM	ADULT	PAGE ADULT	PAID	90019
7/26/17 3:05 PM	ADULT	PAGE ADULT	PAID	90019
7/26/17 3:06 PM	ADULT	PAGE ADULT	PAID	94969
7/26/17 3:06 PM	ADULT	PAGE ADULT	PAID	94969
7/26/17 3:10 PM	ADULT	PAGE ADULT	PAID	7601
7/26/17 3:10 PM	ADULT	PAGE ADULT	PAID	7601
7/26/17 3:11 PM	ADULT	PAGE ADULT	PAID	92831
7/26/17 3:11 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:12 PM	ADULT	PAGE ADULT	PAID	92562
7/26/17 3:15 PM	ADULT	PAGE ADULT	PAID	75214
7/26/17 3:15 PM	ADULT	PAGE ADULT	PAID	75214
7/26/17 3:16 PM	ADULT	PAGE ADULT	PAID	33132
7/26/17 3:16 PM	ADULT	PAGE ADULT	PAID	33132
7/26/17 3:16 PM	ADULT	PAGE ADULT	PAID	33132
7/26/17 3:17 PM	ADULT	PAGE ADULT	PAID	222
7/26/17 3:17 PM	ADULT	PAGE ADULT	PAID	222
7/26/17 3:18 PM	ADULT	PAGE ADULT	PAID	84009
7/26/17 3:18 PM	ADULT	PAGE ADULT	PAID	84009
7/26/17 3:21 PM	ADULT	PAGE ADULT	PAID	94618
7/26/17 3:21 PM	ADULT	PAGE ADULT	PAID	94618
7/26/17 3:21 PM	ADULT	PAGE ADULT	PAID	999br
7/26/17 3:21 PM	ADULT	PAGE ADULT	PAID	999br
7/26/17 3:25 PM	ADULT	PAGE ADULT	PAID	999CH
7/26/17 3:25 PM	ADULT	PAGE ADULT	PAID	999CH
7/26/17 3:26 PM	ADULT	PAGE ADULT	PAID	66062
7/26/17 3:26 PM	ADULT	PAGE ADULT	PAID	66062
7/26/17 3:28 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:28 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:31 PM	ADULT	PAGE ADULT	PAID	32433
7/26/17 3:31 PM	ADULT	PAGE ADULT	PAID	32433
7/26/17 3:31 PM	ADULT	PAGE ADULT	PAID	32433
7/26/17 3:31 PM	ADULT	PAGE ADULT	PAID	90027
7/26/17 3:31 PM	ADULT	PAGE ADULT	PAID	90027
7/26/17 3:32 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:34 PM	ADULT	PAGE ADULT	PAID	77377
7/26/17 3:34 PM	ADULT	PAGE ADULT	PAID	77377
7/26/17 3:38 PM	ADULT	PAGE ADULT	PAID	308
7/26/17 3:40 PM	ADULT	PAGE ADULT	PAID	0

7/26/17 3:40 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:40 PM	ADULT	PAGE ADULT	PAID	0
7/26/17 3:52 PM	ADULT	PAGE ADULT	PAID	999eu
7/26/17 3:52 PM	ADULT	PAGE ADULT	PAID	999eu
7/26/17 3:55 PM	ADULT	PAGE ADULT	PAID	90713
7/26/17 3:55 PM	ADULT	PAGE ADULT	PAID	90713
7/26/17 3:58 PM	ADULT	PAGE ADULT	PAID	999AS
7/26/17 3:58 PM	ADULT	PAGE ADULT	PAID	999AS
7/26/17 4:35 PM	Adventurer Membership	RAPTOR MEMBERSHIP	MEMBERS	92657
7/26/17 4:35 PM	Patron Family Membership	RAPTOR MEMBERSHIP	MEMBERS	92657
7/26/17 4:09 PM	Family Membership	MEMBERSHIP	MEMBERS	11231
7/26/17 4:00 PM	ADULT	PAGE ADULT	PAID	999
7/26/17 4:00 PM	ADULT	PAGE ADULT	PAID	999
7/26/17 4:05 PM	ADULT	PAGE ADULT	PAID	94118
7/26/17 4:10 PM	ADULT	PAGE ADULT	PAID	22
7/26/17 4:16 PM	ADULT	PAGE ADULT	PAID	60625
7/26/17 4:18 PM	ADULT	PAGE ADULT	PAID	222
7/26/17 4:18 PM	ADULT	PAGE ADULT	PAID	222
7/26/17 4:19 PM	ADULT	PAGE ADULT	PAID	91504
7/26/17 4:19 PM	ADULT	PAGE ADULT	PAID	91504
7/26/17 4:19 PM	ADULT	PAGE ADULT	PAID	91504
7/26/17 4:29 PM	ADULT	PAGE ADULT	PAID	20290
7/26/17 4:31 PM	ADULT	PAGE ADULT	PAID	38175
7/26/17 4:32 PM	ADULT	PAGE ADULT	PAID	999cn
7/26/17 4:32 PM	ADULT	PAGE ADULT	PAID	999cn
7/26/17 4:32 PM	ADULT	PAGE ADULT	PAID	999cn
7/26/17 4:32 PM	ADULT	PAGE ADULT	PAID	999cn
7/26/17 4:41 PM	ADULT	PAGE ADULT	PAID	90041
7/26/17 4:10 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 4:10 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/26/17 4:18 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/26/17 4:18 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/26/17 4:21 PM	SENIOR	PAGE SENIOR	PAID	90274
7/26/17 4:21 PM	SENIOR	PAGE SENIOR	PAID	90274
7/26/17 4:05 PM	ADULT	PAGE TEACHER	SCHOOLS	94118
7/26/17 4:21 PM	STUDENT	PAGE STUDENT	PAID	90274
7/26/17 4:38 PM	STUDENT	PAGE STUDENT	PAID	90005
7/26/17 4:01 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	0
7/26/17 4:01 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 4:01 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 4:01 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 4:31 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 4:53 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/26/17 4:36 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90101
7/26/17 4:36 PM	EBT Adult	Page EBT Adult	UNPAID	90101
7/26/17 4:36 PM	EBT Adult	Page EBT Adult	UNPAID	90101

Usage Time	Ticket Type	Type of Visitor	Financial Reporting Group	Zip Code
7/22/17 9:34 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	60441
7/22/17 9:34 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	60441
7/22/17 9:45 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	999bz
7/22/17 9:46 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	999bz
7/22/17 9:47 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	80218
7/22/17 9:47 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	80218
7/22/17 9:31 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	30134
7/22/17 9:57 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	89098
7/22/17 9:57 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	89098
7/22/17 9:39 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	0
7/22/17 9:52 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	90405
7/22/17 9:34 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	60441
7/22/17 9:34 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	60441
7/22/17 9:35 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92374
7/22/17 9:35 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92374
7/22/17 9:36 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92374
7/22/17 9:44 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	53719
7/22/17 9:54 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90720
7/22/17 9:54 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90720
7/22/17 9:54 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90720
7/22/17 9:58 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	44805
7/22/17 9:58 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	44805
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:40 AM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90071
7/22/17 9:55 AM	TarPits Child Admission (2-Under)	PAGE ADULT WEB ND	PAID	90720
7/22/17 9:34 AM	Page Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB COMBO ND	PAID	90503
7/22/17 9:36 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	92374
7/22/17 9:54 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90720
7/22/17 9:34 AM	Page Adult Admission	PAGE ADULT WEB COMBO ND	PAID	90503
7/22/17 9:34 AM	Page Adult Admission	PAGE ADULT WEB COMBO ND	PAID	90503
7/22/17 9:53 AM	Page Adult Admission	PAGE ADULT WEB COMBO ND	PAID	76567
7/22/17 9:53 AM	Page Adult Admission	PAGE ADULT WEB COMBO ND	PAID	76567
7/22/17 9:44 AM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	53719
7/22/17 9:54 AM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90720
7/22/17 9:32 AM	STUDENT	PAGE STUDENT	PAID	95209
7/22/17 9:32 AM	STUDENT	PAGE STUDENT	PAID	95209
7/22/17 9:33 AM	STUDENT	PAGE STUDENT	PAID	86004
7/22/17 9:33 AM	STUDENT	PAGE STUDENT	PAID	86004
7/22/17 9:39 AM	STUDENT	PAGE STUDENT	PAID	75231
7/22/17 9:58 AM	STUDENT	PAGE STUDENT	PAID	91016
7/22/17 9:31 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	92025
7/22/17 9:36 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90294
7/22/17 9:48 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91101
7/22/17 9:52 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90405
7/22/17 9:39 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 9:52 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90405
7/22/17 9:52 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90405
7/22/17 9:42 AM	SENIOR	PAGE SENIOR	PAID	92037
7/22/17 9:55 AM	SENIOR	PAGE SENIOR	PAID	33404
7/22/17 9:55 AM	SENIOR	PAGE SENIOR	PAID	33404
7/22/17 9:56 AM	SENIOR	PAGE SENIOR	PAID	53904
7/22/17 9:56 AM	SENIOR	PAGE SENIOR	PAID	53904
7/22/17 9:57 AM	SENIOR	PAGE SENIOR	PAID	222
7/22/17 9:57 AM	SENIOR	PAGE SENIOR	PAID	222
7/22/17 9:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92025

7/22/17 9:36 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90294
7/22/17 9:42 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92037
7/22/17 9:42 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92037
7/22/17 9:43 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90720
7/22/17 9:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	74953
7/22/17 9:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	74953
7/22/17 9:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	74953
7/22/17 9:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	74953
7/22/17 9:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	74953
7/22/17 9:51 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	89002
7/22/17 9:58 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91016
7/22/17 9:31 AM	ADULT	PAGE ADULT	PAID	92025
7/22/17 9:31 AM	ADULT	PAGE ADULT	PAID	92025
7/22/17 9:31 AM	ADULT	PAGE ADULT	PAID	30134
7/22/17 9:32 AM	ADULT	PAGE ADULT	PAID	95209
7/22/17 9:33 AM	ADULT	PAGE ADULT	PAID	86004
7/22/17 9:36 AM	ADULT	PAGE ADULT	PAID	90294
7/22/17 9:36 AM	ADULT	PAGE ADULT	PAID	90294
7/22/17 9:37 AM	ADULT	PAGE ADULT	PAID	999JP
7/22/17 9:37 AM	ADULT	PAGE ADULT	PAID	999JP
7/22/17 9:39 AM	ADULT	PAGE ADULT	PAID	85224
7/22/17 9:39 AM	ADULT	PAGE ADULT	PAID	85224
7/22/17 9:41 AM	ADULT	PAGE ADULT	PAID	999ch
7/22/17 9:41 AM	ADULT	PAGE ADULT	PAID	999ch
7/22/17 9:43 AM	ADULT	PAGE ADULT	PAID	90720
7/22/17 9:43 AM	ADULT	PAGE ADULT	PAID	90720
7/22/17 9:43 AM	ADULT	PAGE ADULT	PAID	74953
7/22/17 9:43 AM	ADULT	PAGE ADULT	PAID	74953
7/22/17 9:47 AM	ADULT	PAGE ADULT	PAID	92071
7/22/17 9:47 AM	ADULT	PAGE ADULT	PAID	92071
7/22/17 9:48 AM	ADULT	PAGE ADULT	PAID	91101
7/22/17 9:48 AM	ADULT	PAGE ADULT	PAID	91101
7/22/17 9:51 AM	ADULT	PAGE ADULT	PAID	89002
7/22/17 9:51 AM	ADULT	PAGE ADULT	PAID	89002
7/22/17 9:57 AM	ADULT	PAGE ADULT	PAID	89098
7/22/17 9:58 AM	ADULT	PAGE ADULT	PAID	91016
7/22/17 9:58 AM	ADULT	PAGE ADULT	PAID	89103
7/22/17 9:58 AM	ADULT	PAGE ADULT	PAID	89103
7/22/17 9:50 AM	Family Membership	RAPTOR MEMBERSHIP	MEMBERS	90045
7/22/17 9:50 AM	Adventurer Membership	RAPTOR MEMBERSHIP	MEMBERS	90045
7/22/17 9:50 AM	Family Membership	RAPTOR MEMBERSHIP	MEMBERS	90045
7/22/17 9:46 AM	Family Membership	MEMBERSHIP	MEMBERS	90043
7/22/17 10:28 AM	Family Membership (2 Year)	MEMBERSHIP	MEMBERS	91782
7/22/17 10:00 AM	Family Membership	MEMBERSHIP	MEMBERS	90036
7/22/17 10:26 AM	Family Membership	MEMBERSHIP	MEMBERS	90807
7/22/17 10:49 AM	Family Membership	MEMBERSHIP	MEMBERS	91401
7/22/17 10:39 AM	Family Membership	MEMBERSHIP	MEMBERS	90004
7/22/17 10:56 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	90004
7/22/17 10:42 AM	Dual Membership	MEMBERSHIP	MEMBERS	90212
7/22/17 10:59 AM	Family Membership (14M)	MEMBERSHIP	MEMBERS	91354
7/22/17 10:42 AM	Dual Membership	MEMBERSHIP	MEMBERS	93063
7/22/17 10:49 AM	Family Membership Plus	MEMBERSHIP	MEMBERS	91301
7/22/17 10:01 AM	Family Membership	MEMBERSHIP	MEMBERS	91387
7/22/17 10:00 AM	ADULT	PAGE ADULT	PAID	92860
7/22/17 10:00 AM	ADULT	PAGE ADULT	PAID	92860
7/22/17 10:00 AM	ADULT	PAGE ADULT	PAID	92091
7/22/17 10:02 AM	ADULT	PAGE ADULT	PAID	46544
7/22/17 10:02 AM	ADULT	PAGE ADULT	PAID	46544
7/22/17 10:04 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:04 AM	ADULT	PAGE ADULT	PAID	92027
7/22/17 10:04 AM	ADULT	PAGE ADULT	PAID	92027
7/22/17 10:05 AM	ADULT	PAGE ADULT	PAID	11601
7/22/17 10:06 AM	ADULT	PAGE ADULT	PAID	91320
7/22/17 10:06 AM	ADULT	PAGE ADULT	PAID	91320
7/22/17 10:07 AM	ADULT	PAGE ADULT	PAID	29501

7/22/17 10:07 AM	ADULT	PAGE ADULT	PAID	29501
7/22/17 10:07 AM	ADULT	PAGE ADULT	PAID	95127
7/22/17 10:08 AM	ADULT	PAGE ADULT	PAID	98038
7/22/17 10:08 AM	ADULT	PAGE ADULT	PAID	98038
7/22/17 10:08 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:08 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:09 AM	ADULT	PAGE ADULT	PAID	92301
7/22/17 10:09 AM	ADULT	PAGE ADULT	PAID	92301
7/22/17 10:10 AM	ADULT	PAGE ADULT	PAID	93277
7/22/17 10:10 AM	ADULT	PAGE ADULT	PAID	95366
7/22/17 10:11 AM	ADULT	PAGE ADULT	PAID	91709
7/22/17 10:11 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:11 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:11 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:12 AM	ADULT	PAGE ADULT	PAID	91505
7/22/17 10:12 AM	ADULT	PAGE ADULT	PAID	91762
7/22/17 10:12 AM	ADULT	PAGE ADULT	PAID	91762
7/22/17 10:14 AM	ADULT	PAGE ADULT	PAID	22602
7/22/17 10:17 AM	ADULT	PAGE ADULT	PAID	90402
7/22/17 10:17 AM	ADULT	PAGE ADULT	PAID	91001
7/22/17 10:17 AM	ADULT	PAGE ADULT	PAID	62249
7/22/17 10:17 AM	ADULT	PAGE ADULT	PAID	91001
7/22/17 10:17 AM	ADULT	PAGE ADULT	PAID	62249
7/22/17 10:20 AM	ADULT	PAGE ADULT	PAID	90265
7/22/17 10:22 AM	ADULT	PAGE ADULT	PAID	90210
7/22/17 10:24 AM	ADULT	PAGE ADULT	PAID	80303
7/22/17 10:25 AM	ADULT	PAGE ADULT	PAID	999CN
7/22/17 10:25 AM	ADULT	PAGE ADULT	PAID	999CN
7/22/17 10:28 AM	ADULT	PAGE ADULT	PAID	98727
7/22/17 10:31 AM	ADULT	PAGE ADULT	PAID	999EU
7/22/17 10:31 AM	ADULT	PAGE ADULT	PAID	999EU
7/22/17 10:34 AM	ADULT	PAGE ADULT	PAID	999BR
7/22/17 10:34 AM	ADULT	PAGE ADULT	PAID	999BR
7/22/17 10:36 AM	ADULT	PAGE ADULT	PAID	91737
7/22/17 10:36 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:36 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:36 AM	ADULT	PAGE ADULT	PAID	9133
7/22/17 10:36 AM	ADULT	PAGE ADULT	PAID	9133
7/22/17 10:37 AM	ADULT	PAGE ADULT	PAID	91016
7/22/17 10:37 AM	ADULT	PAGE ADULT	PAID	91302
7/22/17 10:39 AM	ADULT	PAGE ADULT	PAID	85260
7/22/17 10:39 AM	ADULT	PAGE ADULT	PAID	92562
7/22/17 10:39 AM	ADULT	PAGE ADULT	PAID	92562
7/22/17 10:41 AM	ADULT	PAGE ADULT	PAID	92392
7/22/17 10:41 AM	ADULT	PAGE ADULT	PAID	92392
7/22/17 10:43 AM	ADULT	PAGE ADULT	PAID	94566
7/22/17 10:45 AM	ADULT	PAGE ADULT	PAID	6066
7/22/17 10:45 AM	ADULT	PAGE ADULT	PAID	6066
7/22/17 10:45 AM	ADULT	PAGE ADULT	PAID	90291
7/22/17 10:48 AM	ADULT	PAGE ADULT	PAID	92084
7/22/17 10:48 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:48 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:48 AM	ADULT	PAGE ADULT	PAID	92084
7/22/17 10:49 AM	ADULT	PAGE ADULT	PAID	44133
7/22/17 10:49 AM	ADULT	PAGE ADULT	PAID	44133
7/22/17 10:49 AM	ADULT	PAGE ADULT	PAID	44133
7/22/17 10:51 AM	ADULT	PAGE ADULT	PAID	90230
7/22/17 10:51 AM	ADULT	PAGE ADULT	PAID	90230
7/22/17 10:52 AM	ADULT	PAGE ADULT	PAID	98052
7/22/17 10:53 AM	ADULT	PAGE ADULT	PAID	90036
7/22/17 10:53 AM	ADULT	PAGE ADULT	PAID	90036
7/22/17 10:54 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 10:54 AM	ADULT	PAGE ADULT	PAID	90848
7/22/17 10:54 AM	ADULT	PAGE ADULT	PAID	92264
7/22/17 10:55 AM	ADULT	PAGE ADULT	PAID	93514

7/22/17 10:56 AM	ADULT	PAGE ADULT	PAID	93514
7/22/17 10:56 AM	ADULT	PAGE ADULT	PAID	92708
7/22/17 10:56 AM	ADULT	PAGE ADULT	PAID	92708
7/22/17 10:58 AM	ADULT	PAGE ADULT	PAID	92870
7/22/17 10:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	46544
7/22/17 10:04 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:04 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:06 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91320
7/22/17 10:06 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91320
7/22/17 10:08 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98038
7/22/17 10:08 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98038
7/22/17 10:08 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:08 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:15 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	32553
7/22/17 10:15 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	32553
7/22/17 10:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90402
7/22/17 10:20 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90265
7/22/17 10:22 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90210
7/22/17 10:28 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92886
7/22/17 10:28 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92886
7/22/17 10:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999EU
7/22/17 10:34 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999BR
7/22/17 10:35 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999BR
7/22/17 10:36 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91737
7/22/17 10:36 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91737
7/22/17 10:36 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91737
7/22/17 10:36 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85260
7/22/17 10:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85260
7/22/17 10:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92562
7/22/17 10:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92562
7/22/17 10:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85260
7/22/17 10:48 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 10:48 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92084
7/22/17 10:48 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92084
7/22/17 10:54 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92264
7/22/17 10:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93514
7/22/17 10:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93514
7/22/17 10:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93514
7/22/17 10:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93514
7/22/17 10:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92708
7/22/17 10:58 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92870
7/22/17 10:00 AM	SENIOR	PAGE SENIOR	PAID	89509
7/22/17 10:00 AM	SENIOR	PAGE SENIOR	PAID	89509
7/22/17 10:17 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 10:17 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 10:21 AM	SENIOR	PAGE SENIOR	PAID	95124
7/22/17 10:24 AM	SENIOR	PAGE SENIOR	PAID	80303
7/22/17 10:24 AM	SENIOR	PAGE SENIOR	PAID	80303
7/22/17 10:28 AM	SENIOR	PAGE SENIOR	PAID	999EU
7/22/17 10:28 AM	SENIOR	PAGE SENIOR	PAID	999EU
7/22/17 10:39 AM	SENIOR	PAGE SENIOR	PAID	85260
7/22/17 10:46 AM	SENIOR	PAGE SENIOR	PAID	92078
7/22/17 10:49 AM	SENIOR	PAGE SENIOR	PAID	44133
7/22/17 10:49 AM	SENIOR	PAGE SENIOR	PAID	44133
7/22/17 10:54 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 10:15 AM	ADULT	PAGE TEACHER	SCHOOLS	32553
7/22/17 10:42 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	53705
7/22/17 10:42 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	32827
7/22/17 10:42 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	53705
7/22/17 10:42 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	32827
7/22/17 10:52 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92679
7/22/17 10:52 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92679

7/22/17 10:17 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90402
7/22/17 10:20 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90265
7/22/17 10:51 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/22/17 10:00 AM	STUDENT	PAGE STUDENT	PAID	92860
7/22/17 10:02 AM	STUDENT	PAGE STUDENT	PAID	46544
7/22/17 10:11 AM	STUDENT	PAGE STUDENT	PAID	91709
7/22/17 10:16 AM	STUDENT	PAGE STUDENT	PAID	0
7/22/17 10:22 AM	STUDENT	PAGE STUDENT	PAID	90210
7/22/17 10:28 AM	STUDENT	PAGE STUDENT	PAID	98727
7/22/17 10:28 AM	STUDENT	PAGE STUDENT	PAID	98727
7/22/17 10:31 AM	STUDENT	PAGE STUDENT	PAID	999EU
7/22/17 10:31 AM	STUDENT	PAGE STUDENT	PAID	999EU
7/22/17 10:44 AM	STUDENT	PAGE STUDENT	PAID	94566
7/22/17 10:45 AM	STUDENT	PAGE STUDENT	PAID	6066
7/22/17 10:45 AM	STUDENT	PAGE STUDENT	PAID	6066
7/22/17 10:45 AM	STUDENT	PAGE STUDENT	PAID	6066
7/22/17 10:52 AM	STUDENT	PAGE STUDENT	PAID	98052
7/22/17 10:54 AM	STUDENT	PAGE STUDENT	PAID	92264
7/22/17 10:56 AM	STUDENT	PAGE STUDENT	PAID	92708
7/22/17 10:58 AM	STUDENT	PAGE STUDENT	PAID	90066
7/22/17 10:58 AM	STUDENT	PAGE STUDENT	PAID	92870
7/22/17 10:58 AM	STUDENT	PAGE STUDENT	PAID	222
7/22/17 10:31 AM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	89509
7/22/17 10:45 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	92563
7/22/17 10:03 AM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	30305
7/22/17 10:03 AM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	30305
7/22/17 10:03 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	30305
7/22/17 10:31 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	89509
7/22/17 10:45 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92563
7/22/17 10:45 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	92563
7/22/17 10:52 AM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90001
7/22/17 10:52 AM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90001
7/22/17 10:52 AM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90001
7/22/17 10:52 AM	EBT Adult	Page EBT Adult	UNPAID	90001
7/22/17 10:52 AM	EBT Adult	Page EBT Adult	UNPAID	90001
7/22/17 10:42 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	53705
7/22/17 10:42 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	32827
7/22/17 10:42 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	32827
7/22/17 10:52 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	92679
7/22/17 10:00 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92091
7/22/17 10:00 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92091
7/22/17 10:07 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	95127
7/22/17 10:11 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91709
7/22/17 10:16 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	0
7/22/17 10:23 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	80303
7/22/17 10:45 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	90291
7/22/17 10:48 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92084
7/22/17 10:52 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	98052
7/22/17 11:43 AM	ADULT	PAGE COMP TICKET CHILD	UNPAID	96706
7/22/17 11:18 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	90242
7/22/17 11:18 AM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	90242
7/22/17 11:01 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	93111
7/22/17 11:01 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	93111
7/22/17 11:01 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	93111
7/22/17 11:30 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	85132
7/22/17 11:45 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	90250
7/22/17 11:45 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	90250
7/22/17 11:45 AM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	90250
7/22/17 11:18 AM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	90242
7/22/17 11:03 AM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/22/17 11:03 AM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/22/17 11:24 AM	EBT Adult	Page EBT Adult	UNPAID	91724
7/22/17 11:24 AM	EBT Adult	Page EBT Adult	UNPAID	91724
7/22/17 11:13 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	93445
7/22/17 11:14 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	93445

7/22/17 11:15 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	93445
7/22/17 11:20 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	91109
7/22/17 11:21 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90660
7/22/17 11:21 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90660
7/22/17 11:24 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	91325
7/22/17 11:24 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	91325
7/22/17 11:35 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	95762
7/22/17 11:35 AM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	95762
7/22/17 11:20 AM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	0
7/22/17 11:20 AM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	0
7/22/17 11:13 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	93445
7/22/17 11:13 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	93445
7/22/17 11:13 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	93445
7/22/17 11:14 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	93445
7/22/17 11:14 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	93445
7/22/17 11:20 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	91109
7/22/17 11:21 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90660
7/22/17 11:21 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90660
7/22/17 11:24 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	91325
7/22/17 11:24 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	91325
7/22/17 11:24 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	91325
7/22/17 11:35 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	95762
7/22/17 11:36 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	95762
7/22/17 11:36 AM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	95762
7/22/17 11:02 AM	Page Adult Admission	PAGE ADULT WEB COMBO ND	PAID	4068
7/22/17 11:02 AM	Page Adult Admission	PAGE ADULT WEB COMBO ND	PAID	4068
7/22/17 11:02 AM	Page Adult Admission	PAGE ADULT WEB COMBO ND	PAID	4068
7/22/17 11:08 AM	STUDENT	PAGE STUDENT	PAID	85859
7/22/17 11:11 AM	STUDENT	PAGE STUDENT	PAID	53013
7/22/17 11:13 AM	STUDENT	PAGE STUDENT	PAID	90216
7/22/17 11:13 AM	STUDENT	PAGE STUDENT	PAID	90216
7/22/17 11:13 AM	STUDENT	PAGE STUDENT	PAID	90216
7/22/17 11:13 AM	STUDENT	PAGE STUDENT	PAID	77450
7/22/17 11:20 AM	STUDENT	PAGE STUDENT	PAID	999AU
7/22/17 11:20 AM	STUDENT	PAGE STUDENT	PAID	999AU
7/22/17 11:27 AM	STUDENT	PAGE STUDENT	PAID	91732
7/22/17 11:29 AM	STUDENT	PAGE STUDENT	PAID	63368
7/22/17 11:29 AM	STUDENT	PAGE STUDENT	PAID	63368
7/22/17 11:29 AM	STUDENT	PAGE STUDENT	PAID	63304
7/22/17 11:31 AM	STUDENT	PAGE STUDENT	PAID	90605
7/22/17 11:34 AM	STUDENT	PAGE STUDENT	PAID	11374
7/22/17 11:34 AM	STUDENT	PAGE STUDENT	PAID	11374
7/22/17 11:38 AM	STUDENT	PAGE STUDENT	PAID	2
7/22/17 11:39 AM	STUDENT	PAGE STUDENT	PAID	30064
7/22/17 11:39 AM	STUDENT	PAGE STUDENT	PAID	63303
7/22/17 11:39 AM	STUDENT	PAGE STUDENT	PAID	63303
7/22/17 11:41 AM	STUDENT	PAGE STUDENT	PAID	77433
7/22/17 11:43 AM	STUDENT	PAGE STUDENT	PAID	91739
7/22/17 11:43 AM	STUDENT	PAGE STUDENT	PAID	0
7/22/17 11:47 AM	STUDENT	PAGE STUDENT	PAID	34202
7/22/17 11:48 AM	STUDENT	PAGE STUDENT	PAID	34237
7/22/17 11:51 AM	STUDENT	PAGE STUDENT	PAID	90303
7/22/17 11:53 AM	STUDENT	PAGE STUDENT	PAID	999br
7/22/17 11:55 AM	STUDENT	PAGE STUDENT	PAID	0
7/22/17 11:55 AM	STUDENT	PAGE STUDENT	PAID	0
7/22/17 11:58 AM	STUDENT	PAGE STUDENT	PAID	58103
7/22/17 11:58 AM	STUDENT	PAGE STUDENT	PAID	94550
7/22/17 11:02 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91306
7/22/17 11:08 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90017
7/22/17 11:17 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/22/17 11:37 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	94128
7/22/17 11:40 AM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/22/17 11:01 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93111
7/22/17 11:01 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93111
7/22/17 11:08 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90017

7/22/17 11:30 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	85132
7/22/17 11:30 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	85132
7/22/17 11:38 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91356
7/22/17 11:38 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91356
7/22/17 11:45 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90250
7/22/17 11:45 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90250
7/22/17 11:48 AM	ADULT	PAGE COMP TICKET ADULT	UNPAID	34237
7/22/17 11:43 AM	ADULT	PAGE TEACHER	SCHOOLS	91739
7/22/17 11:48 AM	ADULT	PAGE TEACHER	SCHOOLS	222
7/22/17 11:49 AM	ADULT	PAGE TEACHER	SCHOOLS	222
7/22/17 11:03 AM	SENIOR	PAGE SENIOR	PAID	20124
7/22/17 11:05 AM	SENIOR	PAGE SENIOR	PAID	91711
7/22/17 11:05 AM	SENIOR	PAGE SENIOR	PAID	91711
7/22/17 11:05 AM	SENIOR	PAGE SENIOR	PAID	34103
7/22/17 11:08 AM	SENIOR	PAGE SENIOR	PAID	85859
7/22/17 11:22 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 11:22 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 11:31 AM	SENIOR	PAGE SENIOR	PAID	87654
7/22/17 11:36 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 11:36 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 11:39 AM	SENIOR	PAGE SENIOR	PAID	30064
7/22/17 11:46 AM	SENIOR	PAGE SENIOR	PAID	92545
7/22/17 11:46 AM	SENIOR	PAGE SENIOR	PAID	92545
7/22/17 11:50 AM	SENIOR	PAGE SENIOR	PAID	96106
7/22/17 11:50 AM	SENIOR	PAGE SENIOR	PAID	96106
7/22/17 11:50 AM	SENIOR	PAGE SENIOR	PAID	90731
7/22/17 11:53 AM	SENIOR	PAGE SENIOR	PAID	999br
7/22/17 11:53 AM	SENIOR	PAGE SENIOR	PAID	999br
7/22/17 11:54 AM	SENIOR	PAGE SENIOR	PAID	90251
7/22/17 11:54 AM	SENIOR	PAGE SENIOR	PAID	78738
7/22/17 11:54 AM	SENIOR	PAGE SENIOR	PAID	78738
7/22/17 11:54 AM	SENIOR	PAGE SENIOR	PAID	78738
7/22/17 11:55 AM	SENIOR	PAGE SENIOR	PAID	0
7/22/17 11:00 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98038
7/22/17 11:00 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98030
7/22/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95128
7/22/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95128
7/22/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98042
7/22/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92251
7/22/17 11:02 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92251
7/22/17 11:05 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	34103
7/22/17 11:08 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91739
7/22/17 11:09 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	33612
7/22/17 11:13 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92705
7/22/17 11:15 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	44126
7/22/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 11:17 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 11:21 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94941
7/22/17 11:21 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94941
7/22/17 11:24 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92591
7/22/17 11:24 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	98038
7/22/17 11:27 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94960
7/22/17 11:27 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94960
7/22/17 11:28 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999SA
7/22/17 11:28 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	CH999
7/22/17 11:28 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	CH999
7/22/17 11:29 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	63304
7/22/17 11:31 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999MX
7/22/17 11:33 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 11:34 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999AS
7/22/17 11:34 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999AS
7/22/17 11:34 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999AS
7/22/17 11:35 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 11:36 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90004
7/22/17 11:36 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0

7/22/17 11:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	87654
7/22/17 11:39 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	87654
7/22/17 11:40 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	IT999
7/22/17 11:40 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 11:41 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	*9026
7/22/17 11:41 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	*9026
7/22/17 11:41 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	*9026
7/22/17 11:43 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	96706
7/22/17 11:43 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91739
7/22/17 11:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	27625
7/22/17 11:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	27625
7/22/17 11:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	27625
7/22/17 11:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	27625
7/22/17 11:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91745
7/22/17 11:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91745
7/22/17 11:44 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91745
7/22/17 11:46 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91784
7/22/17 11:46 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91784
7/22/17 11:46 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91784
7/22/17 11:48 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95120
7/22/17 11:48 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95120
7/22/17 11:49 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	31190
7/22/17 11:50 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	75494
7/22/17 11:52 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	24141
7/22/17 11:52 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	24141
7/22/17 11:52 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	24141
7/22/17 11:52 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91302
7/22/17 11:54 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	78738
7/22/17 11:54 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	78738
7/22/17 11:54 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	78738
7/22/17 11:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92620
7/22/17 11:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92620
7/22/17 11:56 AM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90293
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	6041
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	6041
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	6041
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	74868
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	74868
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	74868
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	98038
7/22/17 11:00 AM	ADULT	PAGE ADULT	PAID	98030
7/22/17 11:01 AM	ADULT	PAGE ADULT	PAID	95128
7/22/17 11:02 AM	ADULT	PAGE ADULT	PAID	95128
7/22/17 11:02 AM	ADULT	PAGE ADULT	PAID	98042
7/22/17 11:02 AM	ADULT	PAGE ADULT	PAID	98042
7/22/17 11:02 AM	ADULT	PAGE ADULT	PAID	91306
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7/22/17 11:03 AM	ADULT	PAGE ADULT	PAID	67156
7/22/17 11:03 AM	ADULT	PAGE ADULT	PAID	20124
7/22/17 11:04 AM	ADULT	PAGE ADULT	PAID	98102
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7/22/17 11:04 AM	ADULT	PAGE ADULT	PAID	90293
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7/22/17 11:05 AM	ADULT	PAGE ADULT	PAID	91711
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7/22/17 11:05 AM	ADULT	PAGE ADULT	PAID	78061
7/22/17 11:05 AM	ADULT	PAGE ADULT	PAID	78061
7/22/17 11:05 AM	ADULT	PAGE ADULT	PAID	34103
7/22/17 11:05 AM	ADULT	PAGE ADULT	PAID	34103

7/22/17 11:07 AM	ADULT	PAGE ADULT	PAID	33559
7/22/17 11:07 AM	ADULT	PAGE ADULT	PAID	33559
7/22/17 11:08 AM	ADULT	PAGE ADULT	PAID	85859
7/22/17 11:08 AM	ADULT	PAGE ADULT	PAID	91739
7/22/17 11:08 AM	ADULT	PAGE ADULT	PAID	91739
7/22/17 11:08 AM	ADULT	PAGE ADULT	PAID	90017
7/22/17 11:09 AM	ADULT	PAGE ADULT	PAID	33612
7/22/17 11:09 AM	ADULT	PAGE ADULT	PAID	33612
7/22/17 11:13 AM	ADULT	PAGE ADULT	PAID	92705
7/22/17 11:13 AM	ADULT	PAGE ADULT	PAID	90216
7/22/17 11:13 AM	ADULT	PAGE ADULT	PAID	77450
7/22/17 11:15 AM	ADULT	PAGE ADULT	PAID	44126
7/22/17 11:15 AM	ADULT	PAGE ADULT	PAID	44126
7/22/17 11:15 AM	ADULT	PAGE ADULT	PAID	44126
7/22/17 11:17 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 11:17 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 11:18 AM	ADULT	PAGE ADULT	PAID	91776
7/22/17 11:18 AM	ADULT	PAGE ADULT	PAID	91776
7/22/17 11:18 AM	ADULT	PAGE ADULT	PAID	95942
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7/22/17 11:20 AM	ADULT	PAGE ADULT	PAID	999AU
7/22/17 11:20 AM	ADULT	PAGE ADULT	PAID	999AU
7/22/17 11:21 AM	ADULT	PAGE ADULT	PAID	94941
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7/22/17 11:21 AM	ADULT	PAGE ADULT	PAID	94941
7/22/17 11:22 AM	ADULT	PAGE ADULT	PAID	93212
7/22/17 11:22 AM	ADULT	PAGE ADULT	PAID	93212
7/22/17 11:23 AM	ADULT	PAGE ADULT	PAID	92591
7/22/17 11:24 AM	ADULT	PAGE ADULT	PAID	98038
7/22/17 11:24 AM	ADULT	PAGE ADULT	PAID	98038
7/22/17 11:26 AM	ADULT	PAGE ADULT	PAID	999AU
7/22/17 11:26 AM	ADULT	PAGE ADULT	PAID	AUS99
7/22/17 11:27 AM	ADULT	PAGE ADULT	PAID	94960
7/22/17 11:27 AM	ADULT	PAGE ADULT	PAID	94960
7/22/17 11:27 AM	ADULT	PAGE ADULT	PAID	999SA
7/22/17 11:28 AM	ADULT	PAGE ADULT	PAID	91733
7/22/17 11:28 AM	ADULT	PAGE ADULT	PAID	999SA
7/22/17 11:28 AM	ADULT	PAGE ADULT	PAID	999SA
7/22/17 11:28 AM	ADULT	PAGE ADULT	PAID	91733
7/22/17 11:28 AM	ADULT	PAGE ADULT	PAID	CH999
7/22/17 11:28 AM	ADULT	PAGE ADULT	PAID	CH999
7/22/17 11:29 AM	ADULT	PAGE ADULT	PAID	63368
7/22/17 11:29 AM	ADULT	PAGE ADULT	PAID	63304
7/22/17 11:31 AM	ADULT	PAGE ADULT	PAID	90605
7/22/17 11:31 AM	ADULT	PAGE ADULT	PAID	87654
7/22/17 11:31 AM	ADULT	PAGE ADULT	PAID	999MX
7/22/17 11:31 AM	ADULT	PAGE ADULT	PAID	23234
7/22/17 11:31 AM	ADULT	PAGE ADULT	PAID	999MX
7/22/17 11:31 AM	ADULT	PAGE ADULT	PAID	23234
7/22/17 11:33 AM	ADULT	PAGE ADULT	PAID	0
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7/22/17 11:34 AM	ADULT	PAGE ADULT	PAID	999AS
7/22/17 11:34 AM	ADULT	PAGE ADULT	PAID	999AS
7/22/17 11:34 AM	ADULT	PAGE ADULT	PAID	999AS
7/22/17 11:34 AM	ADULT	PAGE ADULT	PAID	999AS
7/22/17 11:34 AM	ADULT	PAGE ADULT	PAID	11374
7/22/17 11:34 AM	ADULT	PAGE ADULT	PAID	999AS
7/22/17 11:36 AM	ADULT	PAGE ADULT	PAID	90004
7/22/17 11:36 AM	ADULT	PAGE ADULT	PAID	90004
7/22/17 11:36 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 11:37 AM	ADULT	PAGE ADULT	PAID	94128
7/22/17 11:37 AM	ADULT	PAGE ADULT	PAID	94128
7/22/17 11:37 AM	ADULT	PAGE ADULT	PAID	94128
7/22/17 11:37 AM	ADULT	PAGE ADULT	PAID	94128

7/22/17 11:39 AM	ADULT	PAGE ADULT	PAID	87654
7/22/17 11:39 AM	ADULT	PAGE ADULT	PAID	87654
7/22/17 11:39 AM	ADULT	PAGE ADULT	PAID	30064
7/22/17 11:39 AM	ADULT	PAGE ADULT	PAID	63303
7/22/17 11:40 AM	ADULT	PAGE ADULT	PAID	IT999
7/22/17 11:40 AM	ADULT	PAGE ADULT	PAID	IT999
7/22/17 11:40 AM	ADULT	PAGE ADULT	PAID	0
7/22/17 11:41 AM	ADULT	PAGE ADULT	PAID	*9026
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7/22/17 12:58 PM	SENIOR	PAGE SENIOR	PAID	32547
7/22/17 12:39 PM	ADULT	PAGE TEACHER	SCHOOLS	93065
7/22/17 12:40 PM	ADULT	PAGE TEACHER	SCHOOLS	91342
7/22/17 12:42 PM	ADULT	PAGE TEACHER	SCHOOLS	91360
7/22/17 12:47 PM	ADULT	PAGE TEACHER	SCHOOLS	92118
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555

7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:04 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	93555
7/22/17 12:18 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92648
7/22/17 12:55 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	97006
7/22/17 12:02 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91910
7/22/17 12:09 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	222
7/22/17 12:10 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	98005
7/22/17 12:26 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	94579
7/22/17 12:35 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91011
7/22/17 12:40 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91342
7/22/17 12:41 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	222
7/22/17 12:55 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	95864
7/22/17 12:00 PM	STUDENT	PAGE STUDENT	PAID	74074
7/22/17 12:03 PM	STUDENT	PAGE STUDENT	PAID	999CN
7/22/17 12:03 PM	STUDENT	PAGE STUDENT	PAID	999CN
7/22/17 12:04 PM	STUDENT	PAGE STUDENT	PAID	999eu
7/22/17 12:04 PM	STUDENT	PAGE STUDENT	PAID	999eu
7/22/17 12:06 PM	STUDENT	PAGE STUDENT	PAID	31363
7/22/17 12:07 PM	STUDENT	PAGE STUDENT	PAID	94022
7/22/17 12:11 PM	STUDENT	PAGE STUDENT	PAID	91744
7/22/17 12:13 PM	STUDENT	PAGE STUDENT	PAID	90808
7/22/17 12:13 PM	STUDENT	PAGE STUDENT	PAID	6840
7/22/17 12:15 PM	STUDENT	PAGE STUDENT	PAID	91606
7/22/17 12:15 PM	STUDENT	PAGE STUDENT	PAID	91606
7/22/17 12:20 PM	STUDENT	PAGE STUDENT	PAID	93536
7/22/17 12:21 PM	STUDENT	PAGE STUDENT	PAID	95928
7/22/17 12:21 PM	STUDENT	PAGE STUDENT	PAID	95928
7/22/17 12:23 PM	STUDENT	PAGE STUDENT	PAID	999eu
7/22/17 12:23 PM	STUDENT	PAGE STUDENT	PAID	999eu
7/22/17 12:28 PM	STUDENT	PAGE STUDENT	PAID	90802
7/22/17 12:31 PM	STUDENT	PAGE STUDENT	PAID	92584
7/22/17 12:31 PM	STUDENT	PAGE STUDENT	PAID	92584
7/22/17 12:31 PM	STUDENT	PAGE STUDENT	PAID	53149
7/22/17 12:32 PM	STUDENT	PAGE STUDENT	PAID	93536
7/22/17 12:33 PM	STUDENT	PAGE STUDENT	PAID	222
7/22/17 12:40 PM	STUDENT	PAGE STUDENT	PAID	90026
7/22/17 12:40 PM	STUDENT	PAGE STUDENT	PAID	90026
7/22/17 12:43 PM	STUDENT	PAGE STUDENT	PAID	90057
7/22/17 12:47 PM	STUDENT	PAGE STUDENT	PAID	78649
7/22/17 12:51 PM	STUDENT	PAGE STUDENT	PAID	999AU
7/22/17 12:52 PM	STUDENT	PAGE STUDENT	PAID	999au
7/22/17 12:53 PM	STUDENT	PAGE STUDENT	PAID	94539
7/22/17 12:18 PM	CHILD (3-12)	PAGE COMP TICKET ADULT	UNPAID	92648
7/22/17 12:27 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90245
7/22/17 12:27 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90245
7/22/17 12:28 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90245
7/22/17 12:49 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90404
7/22/17 12:44 PM	TarPits Child Admission (2-Under)	PAGE ADULT WEB ND	PAID	90063
7/22/17 12:50 PM	TarPits Child Admission (2-Under)	PAGE ADULT WEB ND	PAID	90404
7/22/17 12:35 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	92612
7/22/17 12:35 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	92612
7/22/17 12:18 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	92648
7/22/17 12:51 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	111
7/22/17 12:53 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	111
7/22/17 12:11 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	GU34
7/22/17 12:11 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	GU34
7/22/17 12:33 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	89121
7/22/17 12:33 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	89121
7/22/17 12:44 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90063
7/22/17 12:49 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90404
7/22/17 12:49 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90404
7/22/17 12:58 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	93308
7/22/17 12:59 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	93308
7/22/17 12:04 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	93555

7/22/17 12:55 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	97006
7/22/17 12:55 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	97006
7/22/17 12:55 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	97006
7/22/17 12:02 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91910
7/22/17 12:26 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91107
7/22/17 12:31 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92584
7/22/17 12:39 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	93065
7/22/17 12:39 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	93065
7/22/17 12:39 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	93065
7/22/17 12:47 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92118
7/22/17 12:58 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	32547
7/22/17 12:15 PM	Complimentary Admission	NHM/PAGE COMP TICKET	UNPAID	92705
7/22/17 12:15 PM	Complimentary Admission	NHM/PAGE COMP TICKET	UNPAID	92705
7/22/17 1:02 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	222
7/22/17 1:09 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	97978
7/22/17 1:14 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	95292
7/22/17 1:27 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92870
7/22/17 1:28 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	222
7/22/17 1:33 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92688
7/22/17 1:33 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92688
7/22/17 1:38 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	2222
7/22/17 1:40 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	999EU
7/22/17 1:44 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92390
7/22/17 1:46 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91748
7/22/17 1:56 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	96789
7/22/17 1:37 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 1:37 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 1:37 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 1:37 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 1:20 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	3857
7/22/17 1:20 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	3857
7/22/17 1:06 PM	ADULT	PAGE COMBO ADULT	PAID	999UK
7/22/17 1:06 PM	ADULT	PAGE COMBO ADULT	PAID	999UK
7/22/17 1:00 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90804
7/22/17 1:00 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90804
7/22/17 1:16 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	78255
7/22/17 1:16 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	78255
7/22/17 1:38 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90740
7/22/17 1:14 PM	EBT Adult	Page EBT Adult	UNPAID	90230
7/22/17 1:14 PM	EBT Adult	Page EBT Adult	UNPAID	90230
7/22/17 1:46 PM	EBT Adult	Page EBT Adult	UNPAID	91702
7/22/17 1:46 PM	EBT Adult	Page EBT Adult	UNPAID	91702
7/22/17 1:54 PM	EBT Adult	Page EBT Adult	UNPAID	90001
7/22/17 1:14 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90230
7/22/17 1:14 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90230
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7/22/17 1:46 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	91702
7/22/17 1:54 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90001
7/22/17 1:16 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	78255
7/22/17 1:16 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	78255
7/22/17 1:38 PM	Tar Pits Student Admission	PAGE STUDENT WEB ND	PAID	90740
7/22/17 1:00 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90804
7/22/17 1:00 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90804
7/22/17 1:00 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90804
7/22/17 1:38 PM	Tar Pits Senior Admission	PAGE SENIOR WEB ND	PAID	90740
7/22/17 1:06 PM	STUDENT	PAGE COMBO STUDENT	PAID	999UK
7/22/17 1:06 PM	CHILD 3-12	PAGE COMBO CHILD (3-12)	PAID	999UK
7/22/17 1:00 PM	STUDENT	PAGE STUDENT	PAID	19701
7/22/17 1:01 PM	STUDENT	PAGE STUDENT	PAID	80109
7/22/17 1:02 PM	STUDENT	PAGE STUDENT	PAID	222
7/22/17 1:03 PM	STUDENT	PAGE STUDENT	PAID	91606
7/22/17 1:03 PM	STUDENT	PAGE STUDENT	PAID	999ko
7/22/17 1:04 PM	STUDENT	PAGE STUDENT	PAID	999UK
7/22/17 1:04 PM	STUDENT	PAGE STUDENT	PAID	999UK
7/22/17 1:05 PM	STUDENT	PAGE STUDENT	PAID	999ch

7/22/17 1:10 PM	STUDENT	PAGE STUDENT	PAID	20113
7/22/17 1:10 PM	STUDENT	PAGE STUDENT	PAID	20113
7/22/17 1:11 PM	STUDENT	PAGE STUDENT	PAID	96986
7/22/17 1:12 PM	STUDENT	PAGE STUDENT	PAID	0
7/22/17 1:16 PM	STUDENT	PAGE STUDENT	PAID	97812
7/22/17 1:17 PM	STUDENT	PAGE STUDENT	PAID	86574
7/22/17 1:19 PM	STUDENT	PAGE STUDENT	PAID	90002
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7/22/17 1:31 PM	STUDENT	PAGE STUDENT	PAID	90026
7/22/17 1:35 PM	STUDENT	PAGE STUDENT	PAID	92483
7/22/17 1:38 PM	STUDENT	PAGE STUDENT	PAID	92551
7/22/17 1:42 PM	STUDENT	PAGE STUDENT	PAID	94602
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7/22/17 1:50 PM	STUDENT	PAGE STUDENT	PAID	91732
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7/22/17 1:51 PM	STUDENT	PAGE STUDENT	PAID	1890
7/22/17 1:51 PM	STUDENT	PAGE STUDENT	PAID	1890
7/22/17 1:52 PM	STUDENT	PAGE STUDENT	PAID	9706
7/22/17 1:53 PM	STUDENT	PAGE STUDENT	PAID	90745
7/22/17 1:53 PM	STUDENT	PAGE STUDENT	PAID	90745
7/22/17 1:53 PM	STUDENT	PAGE STUDENT	PAID	90712
7/22/17 1:54 PM	STUDENT	PAGE STUDENT	PAID	27518
7/22/17 1:58 PM	STUDENT	PAGE STUDENT	PAID	93921
7/22/17 1:58 PM	STUDENT	PAGE STUDENT	PAID	75075
7/22/17 1:02 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	222
7/22/17 1:02 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90813
7/22/17 1:12 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	89014
7/22/17 1:16 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91606
7/22/17 1:18 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	80232
7/22/17 1:38 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	92551
7/22/17 1:51 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	0
7/22/17 1:19 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	3857
7/22/17 1:19 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	3857
7/22/17 1:48 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90036
7/22/17 1:16 PM	ADULT	PAGE TEACHER	SCHOOLS	91606
7/22/17 1:27 PM	ADULT	PAGE TEACHER	SCHOOLS	92870
7/22/17 1:09 PM	SENIOR	PAGE SENIOR	PAID	90004
7/22/17 1:10 PM	SENIOR	PAGE SENIOR	PAID	20113
7/22/17 1:11 PM	SENIOR	PAGE SENIOR	PAID	96986
7/22/17 1:23 PM	SENIOR	PAGE SENIOR	PAID	80020
7/22/17 1:38 PM	SENIOR	PAGE SENIOR	PAID	94574
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7/22/17 1:41 PM	SENIOR	PAGE SENIOR	PAID	96782
7/22/17 1:45 PM	SENIOR	PAGE SENIOR	PAID	92390
7/22/17 1:49 PM	SENIOR	PAGE SENIOR	PAID	91786
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7/22/17 1:50 PM	SENIOR	PAGE SENIOR	PAID	222
7/22/17 1:57 PM	SENIOR	PAGE SENIOR	PAID	90504
7/22/17 1:58 PM	SENIOR	PAGE SENIOR	PAID	93036
7/22/17 1:58 PM	SENIOR	PAGE SENIOR	PAID	93036
7/22/17 1:59 PM	SENIOR	PAGE SENIOR	PAID	85225
7/22/17 1:01 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91311
7/22/17 1:02 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/22/17 1:02 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/22/17 1:02 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90813

7/22/17 1:02 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93245
7/22/17 1:02 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93245
7/22/17 1:02 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93245
7/22/17 1:03 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999ko
7/22/17 1:05 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22141
7/22/17 1:05 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999ch
7/22/17 1:05 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999ch
7/22/17 1:07 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95353
7/22/17 1:09 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95543
7/22/17 1:09 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94706
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7/22/17 1:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	89014
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7/22/17 1:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93309
7/22/17 1:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93309
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7/22/17 1:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92337
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7/22/17 1:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92337
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7/22/17 1:19 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90002
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7/22/17 1:20 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91733
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7/22/17 1:20 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	96819
7/22/17 1:20 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	96819
7/22/17 1:23 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/22/17 1:23 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	22
7/22/17 1:27 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90019
7/22/17 1:27 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92870
7/22/17 1:27 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92870
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7/22/17 1:27 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92870
7/22/17 1:27 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92870
7/22/17 1:33 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92688
7/22/17 1:33 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90230
7/22/17 1:33 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90230
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7/22/17 1:35 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92483
7/22/17 1:35 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92483
7/22/17 1:38 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94574
7/22/17 1:38 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92551
7/22/17 1:38 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	2222
7/22/17 1:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999EU
7/22/17 1:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999EU
7/22/17 1:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92504
7/22/17 1:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92504
7/22/17 1:45 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90404
7/22/17 1:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999FR
7/22/17 1:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999FR
7/22/17 1:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90068
7/22/17 1:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90068
7/22/17 1:48 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91607
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7/22/17 2:03 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90037
7/22/17 2:04 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	8328
7/22/17 2:04 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/22/17 2:06 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	9361

7/22/17 2:06 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	9361
7/22/17 2:06 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90275
7/22/17 2:06 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90275
7/22/17 2:07 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95661
7/22/17 2:07 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	95661
7/22/17 2:09 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90016
7/22/17 2:09 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90016
7/22/17 2:09 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	60025
7/22/17 2:09 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	60025
7/22/17 2:09 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	60025
7/22/17 2:11 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	0
7/22/17 2:11 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90065
7/22/17 2:11 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91722
7/22/17 2:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	84721
7/22/17 2:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	84721
7/22/17 2:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	84721
7/22/17 2:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92410
7/22/17 2:12 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	48116
7/22/17 2:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85306
7/22/17 2:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85306
7/22/17 2:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85266
7/22/17 2:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92704
7/22/17 2:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92704
7/22/17 2:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92704
7/22/17 2:14 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	97330
7/22/17 2:15 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92704
7/22/17 2:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90004
7/22/17 2:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85050
7/22/17 2:17 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	85050
7/22/17 2:21 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90220
7/22/17 2:21 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90220
7/22/17 2:23 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91750
7/22/17 2:25 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90220
7/22/17 2:25 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90220
7/22/17 2:26 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92691
7/22/17 2:29 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	45237
7/22/17 2:29 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	45237
7/22/17 2:30 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	999KR
7/22/17 2:31 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92251
7/22/17 2:31 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92251
7/22/17 2:31 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92251
7/22/17 2:33 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92120
7/22/17 2:33 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90067
7/22/17 2:33 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92078
7/22/17 2:35 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91342
7/22/17 2:36 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90603
7/22/17 2:36 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90603
7/22/17 2:37 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90247
7/22/17 2:37 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90713
7/22/17 2:38 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94534
7/22/17 2:38 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94534
7/22/17 2:38 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	94534
7/22/17 2:39 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/22/17 2:39 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/22/17 2:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90272
7/22/17 2:40 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90272
7/22/17 2:41 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91362
7/22/17 2:41 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91362
7/22/17 2:41 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91754
7/22/17 2:41 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91202
7/22/17 2:42 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91390
7/22/17 2:43 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91403
7/22/17 2:43 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92064
7/22/17 2:43 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	92064
7/22/17 2:44 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	90014

7/22/17 2:45 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91505
7/22/17 2:45 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91505
7/22/17 2:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/22/17 2:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	222
7/22/17 2:47 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	93063
7/22/17 2:48 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91406
7/22/17 2:54 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91775
7/22/17 2:54 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	91775
7/22/17 2:56 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	43402
7/22/17 2:56 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	43402
7/22/17 2:58 PM	CHILD (3-12)	PAGE CHILD (3-12)	PAID	9235
7/22/17 2:02 PM	SENIOR	PAGE SENIOR	PAID	95003
7/22/17 2:02 PM	SENIOR	PAGE SENIOR	PAID	95003
7/22/17 2:09 PM	SENIOR	PAGE SENIOR	PAID	60025
7/22/17 2:09 PM	SENIOR	PAGE SENIOR	PAID	60025
7/22/17 2:11 PM	SENIOR	PAGE SENIOR	PAID	91722
7/22/17 2:12 PM	SENIOR	PAGE SENIOR	PAID	84721
7/22/17 2:15 PM	SENIOR	PAGE SENIOR	PAID	90630
7/22/17 2:18 PM	SENIOR	PAGE SENIOR	PAID	90242
7/22/17 2:18 PM	SENIOR	PAGE SENIOR	PAID	90242
7/22/17 2:18 PM	SENIOR	PAGE SENIOR	PAID	90242
7/22/17 2:18 PM	SENIOR	PAGE SENIOR	PAID	90242
7/22/17 2:42 PM	SENIOR	PAGE SENIOR	PAID	90027
7/22/17 2:42 PM	SENIOR	PAGE SENIOR	PAID	90027
7/22/17 2:44 PM	SENIOR	PAGE SENIOR	PAID	48178
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7/22/17 2:49 PM	SENIOR	PAGE SENIOR	PAID	999UK
7/22/17 2:49 PM	SENIOR	PAGE SENIOR	PAID	999UK
7/22/17 2:57 PM	SENIOR	PAGE SENIOR	PAID	21921
7/22/17 2:57 PM	SENIOR	PAGE SENIOR	PAID	21921
7/22/17 2:57 PM	SENIOR	PAGE SENIOR	PAID	91361
7/22/17 2:57 PM	SENIOR	PAGE SENIOR	PAID	91361
7/22/17 2:06 PM	ADULT	PAGE TEACHER	SCHOOLS	9361
7/22/17 2:25 PM	ADULT	PAGE TEACHER	SCHOOLS	90220
7/22/17 2:34 PM	ADULT	PAGE TEACHER	SCHOOLS	92557
7/22/17 2:35 PM	ADULT	PAGE TEACHER	SCHOOLS	92557
7/22/17 2:38 PM	ADULT	PAGE TEACHER	SCHOOLS	94534
7/22/17 2:41 PM	ADULT	PAGE TEACHER	SCHOOLS	91754
7/22/17 2:41 PM	ADULT	PAGE TEACHER	SCHOOLS	91202
7/22/17 2:06 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	77494
7/22/17 2:06 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	77494
7/22/17 2:18 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91731
7/22/17 2:18 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91731
7/22/17 2:23 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/22/17 2:23 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	222
7/22/17 2:29 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91731
7/22/17 2:29 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91731
7/22/17 2:38 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90803
7/22/17 2:38 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	90803
7/22/17 2:57 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92869
7/22/17 2:57 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	92869
7/22/17 2:59 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91791
7/22/17 2:59 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	91791
7/22/17 2:01 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	222
7/22/17 2:06 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90275
7/22/17 2:19 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	94588
7/22/17 2:38 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	94534
7/22/17 2:40 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	90028
7/22/17 2:45 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	91325
7/22/17 2:57 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	92869
7/22/17 2:58 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	9235
7/22/17 2:01 PM	STUDENT	PAGE STUDENT	PAID	95747
7/22/17 2:09 PM	STUDENT	PAGE STUDENT	PAID	93555
7/22/17 2:09 PM	STUDENT	PAGE STUDENT	PAID	93555
7/22/17 2:11 PM	STUDENT	PAGE STUDENT	PAID	0

7/22/17 2:11 PM	STUDENT	PAGE STUDENT	PAID	91722
7/22/17 2:13 PM	STUDENT	PAGE STUDENT	PAID	92860
7/22/17 2:13 PM	STUDENT	PAGE STUDENT	PAID	49684
7/22/17 2:14 PM	STUDENT	PAGE STUDENT	PAID	97330
7/22/17 2:15 PM	STUDENT	PAGE STUDENT	PAID	92704
7/22/17 2:15 PM	STUDENT	PAGE STUDENT	PAID	92704
7/22/17 2:19 PM	STUDENT	PAGE STUDENT	PAID	93446
7/22/17 2:19 PM	STUDENT	PAGE STUDENT	PAID	93446
7/22/17 2:19 PM	STUDENT	PAGE STUDENT	PAID	93446
7/22/17 2:19 PM	STUDENT	PAGE STUDENT	PAID	94588
7/22/17 2:20 PM	STUDENT	PAGE STUDENT	PAID	94588
7/22/17 2:24 PM	STUDENT	PAGE STUDENT	PAID	7950
7/22/17 2:24 PM	STUDENT	PAGE STUDENT	PAID	7950
7/22/17 2:26 PM	STUDENT	PAGE STUDENT	PAID	16801
7/22/17 2:29 PM	STUDENT	PAGE STUDENT	PAID	45237
7/22/17 2:32 PM	STUDENT	PAGE STUDENT	PAID	92647
7/22/17 2:32 PM	STUDENT	PAGE STUDENT	PAID	92647
7/22/17 2:32 PM	STUDENT	PAGE STUDENT	PAID	77386
7/22/17 2:32 PM	STUDENT	PAGE STUDENT	PAID	90404
7/22/17 2:33 PM	STUDENT	PAGE STUDENT	PAID	92120
7/22/17 2:33 PM	STUDENT	PAGE STUDENT	PAID	92120
7/22/17 2:34 PM	STUDENT	PAGE STUDENT	PAID	90019
7/22/17 2:35 PM	STUDENT	PAGE STUDENT	PAID	91342
7/22/17 2:35 PM	STUDENT	PAGE STUDENT	PAID	95032
7/22/17 2:37 PM	STUDENT	PAGE STUDENT	PAID	90247
7/22/17 2:40 PM	STUDENT	PAGE STUDENT	PAID	90028
7/22/17 2:42 PM	STUDENT	PAGE STUDENT	PAID	91390
7/22/17 2:42 PM	STUDENT	PAGE STUDENT	PAID	91390
7/22/17 2:45 PM	STUDENT	PAGE STUDENT	PAID	19123
7/22/17 2:45 PM	STUDENT	PAGE STUDENT	PAID	19125
7/22/17 2:46 PM	STUDENT	PAGE STUDENT	PAID	333
7/22/17 2:47 PM	STUDENT	PAGE STUDENT	PAID	2482
7/22/17 2:47 PM	STUDENT	PAGE STUDENT	PAID	2482
7/22/17 2:48 PM	STUDENT	PAGE STUDENT	PAID	90715
7/22/17 2:48 PM	STUDENT	PAGE STUDENT	PAID	90715
7/22/17 2:49 PM	STUDENT	PAGE STUDENT	PAID	90275
7/22/17 2:49 PM	STUDENT	PAGE STUDENT	PAID	90275
7/22/17 2:55 PM	STUDENT	PAGE STUDENT	PAID	92587
7/22/17 2:55 PM	STUDENT	PAGE STUDENT	PAID	92587
7/22/17 2:56 PM	STUDENT	PAGE STUDENT	PAID	91748
7/22/17 2:56 PM	STUDENT	PAGE STUDENT	PAID	10310
7/22/17 2:56 PM	STUDENT	PAGE STUDENT	PAID	95113
7/22/17 2:19 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	90069
7/22/17 2:14 PM	La Brea Tar Pits Adult General Admission	PAGE ADULT WEB ND	PAID	92821
7/22/17 2:14 PM	La Brea Tar Pits Adult General Admission	PAGE ADULT WEB ND	PAID	92879
7/22/17 2:14 PM	La Brea Tar Pits Adult General Admission	PAGE ADULT WEB ND	PAID	92879
7/22/17 2:33 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	92509
7/22/17 2:43 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90222
7/22/17 2:43 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90222
7/22/17 2:33 PM	EBT Adult	Page EBT Adult	UNPAID	92509
7/22/17 2:33 PM	EBT Adult	Page EBT Adult	UNPAID	92509
7/22/17 2:43 PM	EBT Adult	Page EBT Adult	UNPAID	90222
7/22/17 2:43 PM	EBT Adult	Page EBT Adult	UNPAID	90222
7/22/17 2:29 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:30 PM	COMPLIMENTARY BUSINESS GUEST	TARPITS COMP BUSINESS GUEST	UNPAID	90007
7/22/17 2:03 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	91764
7/22/17 2:19 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	90069

7/22/17 2:54 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	1426
7/22/17 2:23 PM	CHILD 3-12	PAGE COMBO CHILD (3-12)	PAID	78757
7/22/17 2:23 PM	ADULT	PAGE COMBO ADULT	PAID	78757
7/22/17 2:30 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	123
7/22/17 2:44 PM	GO LA CHILD	PAGE COMP TICKET CHILD	UNPAID	123
7/22/17 2:38 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/22/17 2:38 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/22/17 2:39 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/22/17 2:39 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
7/22/17 2:06 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	77494
7/22/17 2:06 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	77494
7/22/17 2:06 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	77494
7/22/17 2:06 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	77494
7/22/17 2:18 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91731
7/22/17 2:18 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91731
7/22/17 2:23 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	222
7/22/17 2:23 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	222
7/22/17 2:29 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91731
7/22/17 2:29 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91731
7/22/17 2:38 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	90803
7/22/17 2:30 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	123
7/22/17 2:30 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	123
7/22/17 2:30 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	123
7/22/17 2:44 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	123
7/22/17 2:44 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	123
7/22/17 2:03 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	333
7/22/17 2:19 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	93446
7/22/17 2:37 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	90247
7/22/17 2:38 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	94534
7/22/17 3:00 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91801
7/22/17 3:02 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92084
7/22/17 3:13 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92124
7/22/17 3:16 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	91709
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7/22/17 3:20 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	80921
7/22/17 3:20 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	80921
7/22/17 3:25 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	0
7/22/17 3:19 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	999ch
7/22/17 3:55 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 3:55 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 3:55 PM	GO LA ADULT	PAGE COMP TICKET ADULT	UNPAID	0
7/22/17 3:27 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91709
7/22/17 3:32 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	94030
7/22/17 3:32 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	94030
7/22/17 3:25 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	96793
7/22/17 3:26 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	96793
7/22/17 3:26 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	96793
7/22/17 3:26 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	96793
7/22/17 3:37 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	91701
7/22/17 3:37 PM	Tar Pits Adult Admission	PAGE ADULT WEB ND	PAID	91701
7/22/17 3:41 PM	PAGE COMPLIMENTARY ADULT	PAGE VOLUNTEER GUEST COMP	UNPAID	222
7/22/17 3:21 PM	EBT Adult	Page EBT Adult	UNPAID	91768
7/22/17 3:21 PM	EBT Adult	Page EBT Adult	UNPAID	91768
7/22/17 3:21 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	91768
7/22/17 3:31 PM	La Brea Tar Pits Adult General Admission	PAGE ADULT WEB ND	PAID	92620
7/22/17 3:31 PM	La Brea Tar Pits Adult General Admission	PAGE ADULT WEB ND	PAID	92620
7/22/17 3:31 PM	La Brea Tar Pits Adult General Admission	PAGE ADULT WEB ND	PAID	92620
7/22/17 3:31 PM	La Brea Tar Pits Adult General Admission	PAGE ADULT WEB ND	PAID	92620
7/22/17 3:26 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	96793
7/22/17 3:26 PM	Tar Pits Child Admission (Ages 3-12)	PAGE CHILD(3-12)WEB ND	PAID	96793
7/22/17 3:02 PM	STUDENT	PAGE STUDENT	PAID	92084
7/22/17 3:03 PM	STUDENT	PAGE STUDENT	PAID	94104
7/22/17 3:04 PM	STUDENT	PAGE STUDENT	PAID	1887
7/22/17 3:05 PM	STUDENT	PAGE STUDENT	PAID	999eu

7/22/17 3:08 PM	STUDENT	PAGE STUDENT	PAID	90606
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7/22/17 3:15 PM	STUDENT	PAGE STUDENT	PAID	94582
7/22/17 3:18 PM	STUDENT	PAGE STUDENT	PAID	77019
7/22/17 3:19 PM	STUDENT	PAGE STUDENT	PAID	999fr
7/22/17 3:20 PM	STUDENT	PAGE STUDENT	PAID	0
7/22/17 3:21 PM	STUDENT	PAGE STUDENT	PAID	999eu
7/22/17 3:21 PM	STUDENT	PAGE STUDENT	PAID	999eu
7/22/17 3:23 PM	STUDENT	PAGE STUDENT	PAID	80127
7/22/17 3:23 PM	STUDENT	PAGE STUDENT	PAID	80127
7/22/17 3:23 PM	STUDENT	PAGE STUDENT	PAID	80127
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7/22/17 3:23 PM	STUDENT	PAGE STUDENT	PAID	90003
7/22/17 3:24 PM	STUDENT	PAGE STUDENT	PAID	90003
7/22/17 3:25 PM	STUDENT	PAGE STUDENT	PAID	999br
7/22/17 3:29 PM	STUDENT	PAGE STUDENT	PAID	33157
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7/22/17 3:31 PM	STUDENT	PAGE STUDENT	PAID	91750
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7/22/17 3:36 PM	STUDENT	PAGE STUDENT	PAID	91303
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7/22/17 3:59 PM	STUDENT	PAGE STUDENT	PAID	98203
7/22/17 3:59 PM	STUDENT	PAGE STUDENT	PAID	98203
7/22/17 3:02 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	123
7/22/17 3:03 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	94104
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7/22/17 3:13 PM	CHILD (2-UNDER)	PAGE CHILD (2-UNDER)	UNPAID	92124
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7/22/17 3:32 PM	ADULT	PAGE COMP TICKET ADULT	UNPAID	94030
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7/22/17 4:05 PM	ADULT	PAGE ADULT	PAID	92626
7/22/17 4:07 PM	ADULT	PAGE ADULT	PAID	90313
7/22/17 4:07 PM	ADULT	PAGE ADULT	PAID	90313
7/22/17 4:07 PM	ADULT	PAGE ADULT	PAID	90313
7/22/17 4:09 PM	ADULT	PAGE ADULT	PAID	95111
7/22/17 4:11 PM	ADULT	PAGE ADULT	PAID	92843
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7/22/17 4:25 PM	ADULT	PAGE ADULT	PAID	19422
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7/22/17 4:25 PM	ADULT	PAGE ADULT	PAID	19422
7/22/17 4:26 PM	ADULT	PAGE ADULT	PAID	IRL99
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7/22/17 4:28 PM	ADULT	PAGE ADULT	PAID	90034
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7/22/17 4:29 PM	ADULT	PAGE ADULT	PAID	94903
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7/22/17 4:32 PM	ADULT	PAGE ADULT	PAID	90731

7/22/17 4:32 PM	ADULT	PAGE ADULT	PAID	90731
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7/22/17 4:35 PM	ADULT	PAGE ADULT	PAID	222
7/22/17 4:37 PM	ADULT	PAGE ADULT	PAID	92562
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7/22/17 4:09 PM	EBT CHILD (3-17)	Page EBT Child	UNPAID	90031
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7/22/17 4:12 PM	EBT Adult	Page EBT Adult	UNPAID	90033
7/22/17 4:12 PM	EBT Adult	Page EBT Adult	UNPAID	90033

7/22/17 4:20 PM	EBT Adult	Page EBT Adult	UNPAID	90012
7/22/17 4:20 PM	EBT Adult	Page EBT Adult	UNPAID	90012
7/22/17 4:04 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	91710
7/22/17 4:04 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	222
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7/22/17 4:23 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	97401
7/22/17 4:23 PM	CHILD (3-12)	PAGE COMP TICKET CHILD	UNPAID	97401
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7/22/17 4:07 PM	Tar Pits Admission Adult	GC TP GROUP ADULT	PAID	
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7/22/17 4:08 PM	Tar Pits Admission Student	GC TP GROUP STUDENT	PAID	
7/22/17 4:37 PM	ADULT	PAGE COMP TICKET CHILD	UNPAID	92562

Appendix 3 — Multimodal Traffic Count Sheets

Prepared by National Data & Surveying Services

Ogden Dr & 6th St

Peak Hour Turning Movement Count

ID: 22-020152-001
City: Los Angeles

Day: Thursday
Date: 5/12/2022

PEAK HOURS		COUNT PERIODS
08:00 AM - 09:00 AM		7:00 AM - 09:00 AM
01:00 PM - 02:00 PM		12:00 PM - 02:00 PM
04:00 PM - 05:00 PM		4:00 PM - 06:00 PM

SOUTHBOUND (Ogden Dr)

AM	42	0	18	0	16	AM
NOON	11	0	6	0	15	NOON
PM	19	0	10	0	30	PM
	0.5	0	0.5	0		

EASTBOUND (6th St)

AM	NOON	PM	
1280	678	586	
1	0	6	0
3	7	21	1
322	547	671	1
6	36	15	1

WESTBOUND (6th St)

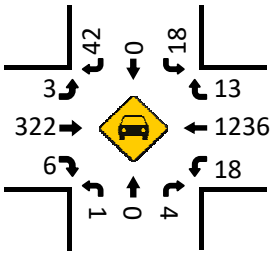
	PM	NOON	AM
0	9	7	13
2	525	644	1236
1	10	28	18
0	1	1	0
	735	587	344

NORTHBOUND (Ogden Dr)

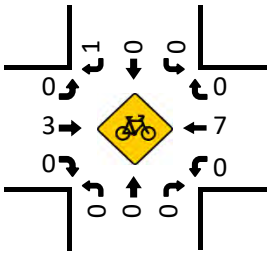
	0	0.5	0	0.5		
PM	25	0	36	0	53	PM
NOON	64	0	23	1	33	NOON
AM	24	0	1	0	4	AM

CONTROL			
Signalized			
TEV	1664	1344	1376
	AM	NOON	PM
PHF	0.97	0.94	0.93

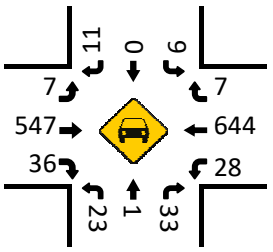
Totals (AM)



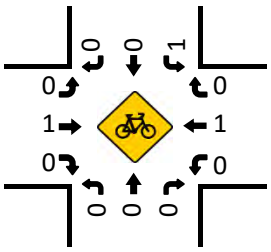
Total Bikes (AM)



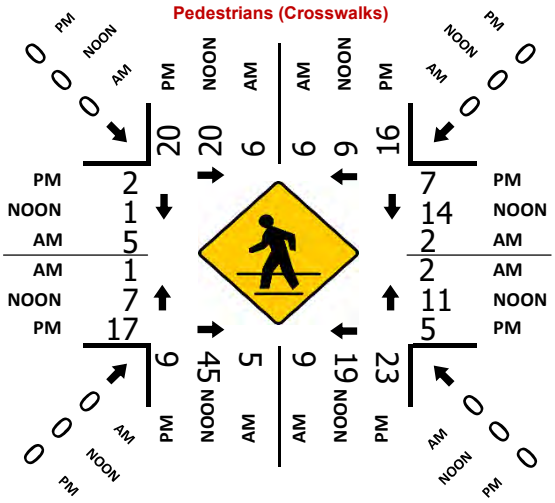
Totals (NOON)



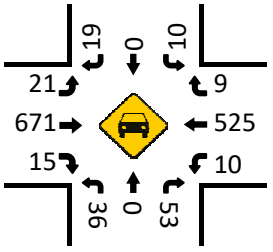
Total Bikes (NOON)



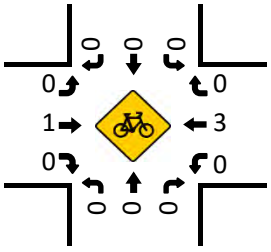
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Prepared by National Data & Surveying Services

Ogden Dr & 6th St

Peak Hour Turning Movement Count

ID: 22-020152-001
City: Los Angeles

Day: Saturday
Date: 5/14/2022

PEAK HOURS		COUNT PERIODS
NONE		NONE
01:00 PM - 02:00 PM		12:00 PM - 02:00 PM
NONE		NONE

SOUTHBOUND

Ogden Dr

AM	0	0	0	0	0	AM
NOON	21	0	9	0	18	NOON
PM	0	0	0	0	0	PM
	0.5	0	0.5	0		

EASTBOUND

6th St

AM	NOON	PM	
0	632	0	
0	0	0	0
0	15	0	1
0	479	0	1
0	70	0	1
AM	NOON	PM	

WESTBOUND

6th St

	PM	NOON	AM
0	0	3	0
2	0	570	0
1	0	44	0
0	0	3	0
	0	535	0
	PM	NOON	AM

CONTROL

Signalized

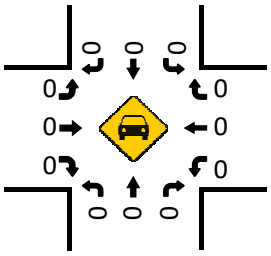
	AM	NOON	PM
TEV	0	1299	0
PHF		0.96	

NORTHBOUND

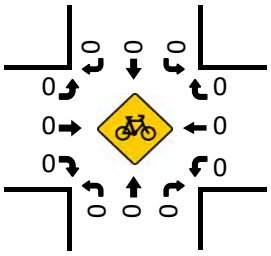
Ogden Dr

	0	0.5	0	0.5		
PM	0	0	0	0	0	PM
NOON	114	0	41	0	44	NOON
AM	0	0	0	0	0	AM

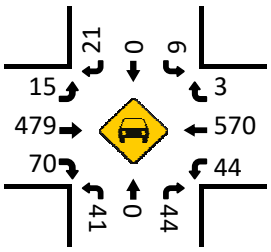
Totals (AM)



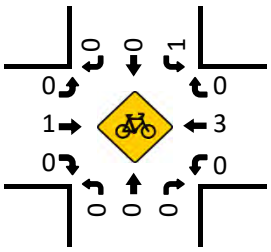
Total Bikes (AM)



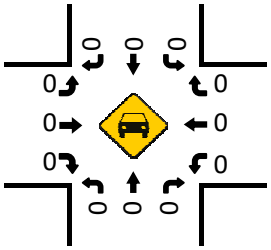
Totals (NOON)



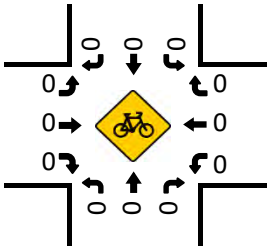
Total Bikes (NOON)



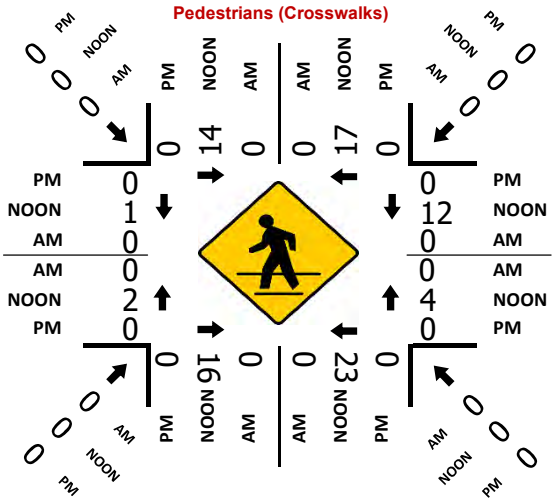
Totals (PM)



Total Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Curson Ave & 6th St

Peak Hour Turning Movement Count

ID: 22-020152-002
City: Los Angeles

Day: Thursday
Date: 5/12/2022

PEAK HOURS

AM	08:00 AM - 09:00 AM
NOON	01:00 PM - 02:00 PM
PM	04:00 PM - 05:00 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	12:00 PM - 02:00 PM
PM	4:00 PM - 06:00 PM

SOUTHBOUND (Curson Ave)

AM	44	85	50	0	109	AM
NOON	49	35	38	0	125	NOON
PM	29	52	53	0	165	PM
	0	1	1	0		

EASTBOUND (6th St)

AM	NOON	PM	
1285	678	540	⇦
1	4	2	0
13	30	35	1
296	466	651	1
49	73	51	1
AM	NOON	PM	

WESTBOUND (6th St)

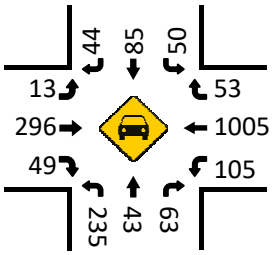
PM	NOON	AM	
70	44	53	0
441	521	1005	2
68	73	105	1
0	0	0	0
914	610	409	⇨
PM	NOON	AM	

NORTHBOUND (Curson Ave)

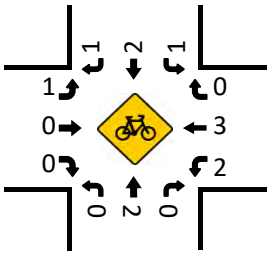
	0	1	1	0		
PM	171	0	68	60	210	PM
NOON	182	1	104	51	106	NOON
AM	239	0	235	43	63	AM

CONTROL			
Signalized			
TEV	2042	1595	1790
	AM	NOON	PM
PHF	0.95	0.95	0.97

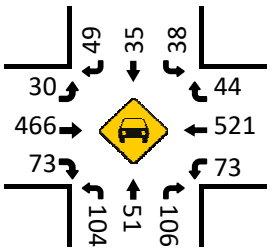
Totals (AM)



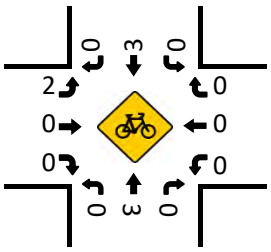
Total Bikes (AM)



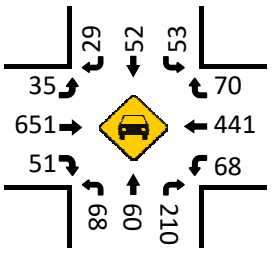
Totals (NOON)



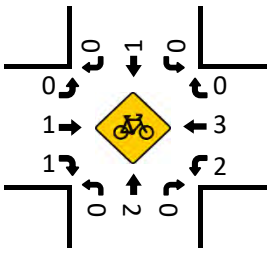
Total Bikes (NOON)



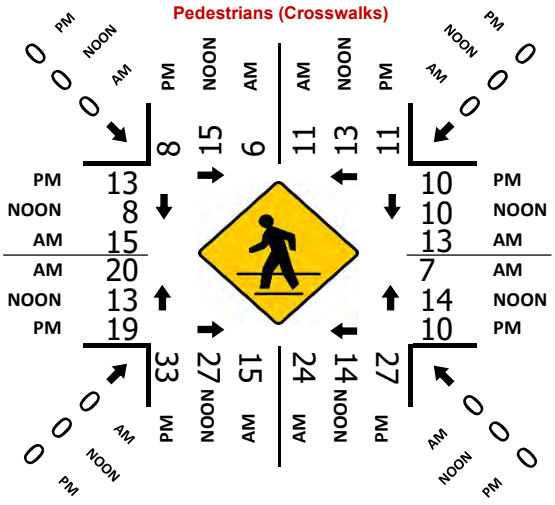
Totals (PM)



Total Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Curson Ave & 6th St

Peak Hour Turning Movement Count

ID: 22-020152-002
City: Los Angeles

Day: Saturday
Date: 5/14/2022

PEAK HOURS

NONE	
01:00 PM - 02:00 PM	
NONE	

COUNT PERIODS

NONE	
12:00 PM - 02:00 PM	
NONE	

SOUTHBOUND (Curson Ave)

AM	0	0	0	0	0	AM
NOON	32	54	48	0	137	NOON
PM	0	0	0	0	0	PM

0 1 1 0

EASTBOUND (6th St)

AM	NOON	PM	
0	618	0	
0	1	0	0
0	38	0	1
0	415	0	1
0	80	0	1
AM	NOON	PM	

WESTBOUND (6th St)

PM	NOON	AM	
0	55	0	0
0	504	0	2
0	81	0	1
0	2	0	0
0	555	0	
PM	NOON	AM	

CONTROL

Signalized

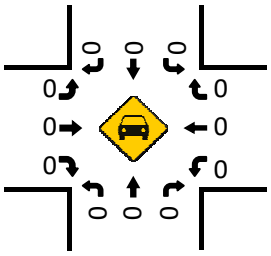
	AM	NOON	PM
TEV	0	1525	0
PHF		0.98	

NORTHBOUND (Curson Ave)

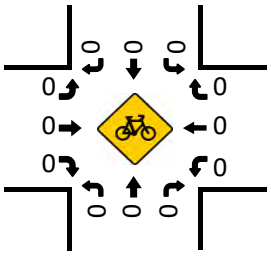
PM	0	0	0	0	0	PM
NOON	215	0	81	44	90	NOON
AM	0	0	0	0	0	AM

0 1 1 0

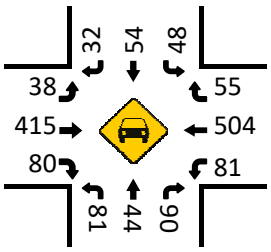
Totals (AM)



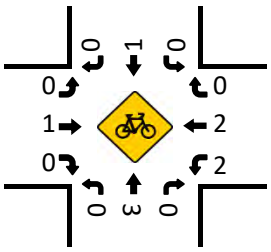
Total Bikes (AM)



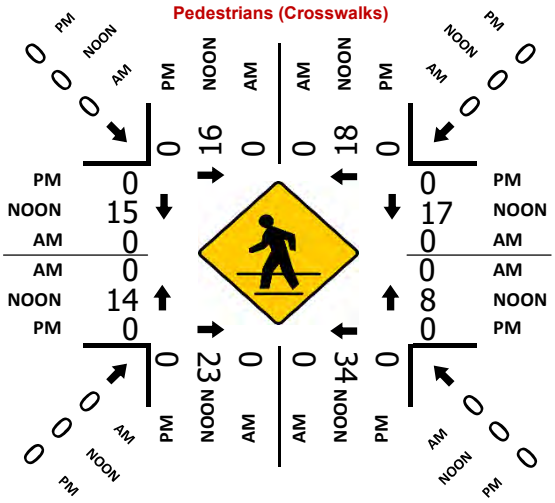
Totals (NOON)



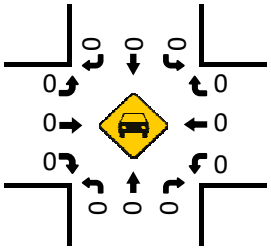
Total Bikes (NOON)



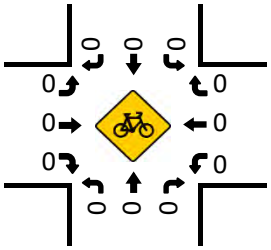
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Prepared by National Data & Surveying Services

Ogden Dr & Wilshire Blvd

Peak Hour Turning Movement Count

ID: 22-020152-005
City: Los Angeles

Day: Thursday
Date: 5/12/2022

Ogden Dr

SOUTHBOUND

AM	0	0	0	0	0	AM	7:00 AM - 09:00 AM
NOON	0	0	0	0	0	NOON	12:00 PM - 02:00 PM
PM	0	0	0	0	0	PM	4:00 PM - 06:00 PM

PEAK HOURS: 07:30 AM - 08:30 AM; 01:00 PM - 02:00 PM; 05:00 PM - 06:00 PM

COUNT PERIODS

EASTBOUND

AM	NOON	PM	
773	501	519	
0	1	0	0
0	0	0	0
364	702	1222	3
4	6	26	0

Wilshire Blvd

WESTBOUND

	PM	NOON	AM
0	0	0	0
2	502	497	769
1	11	2	2
0	1	1	0
	1247	717	366

Wilshire Blvd

CONTROL

Signalized

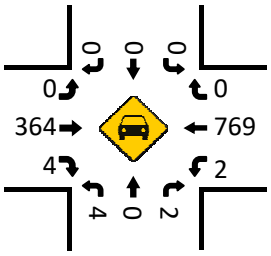
TEV	1145	1227	1803
	AM	NOON	PM
PHF	0.91	0.93	0.94

NORTHBOUND

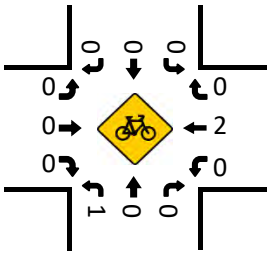
PM	37	0	17	0	24	PM
NOON	9	1	3	0	14	NOON
AM	6	0	4	0	2	AM

Ogden Dr

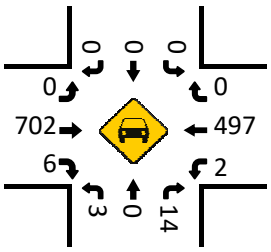
Totals (AM)



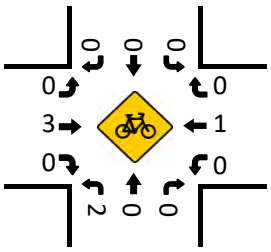
Total Bikes (AM)



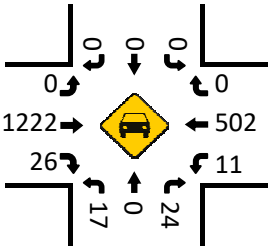
Totals (NOON)



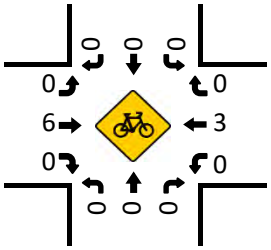
Total Bikes (NOON)



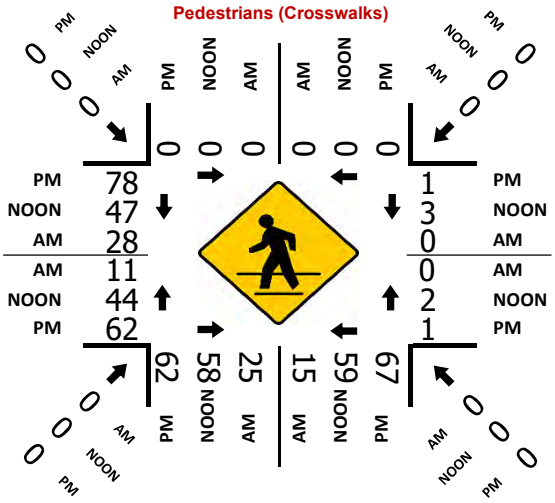
Totals (PM)



Total Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Ogden Dr & Wilshire Blvd

Peak Hour Turning Movement Count

ID: 22-020152-005
City: Los Angeles

Day: Saturday
Date: 5/14/2022

PEAK HOURS		COUNT PERIODS
NONE	AM	NONE
01:00 PM - 02:00 PM	NOON	12:00 PM - 02:00 PM
NONE	PM	NONE

SOUTHBOUND (Ogden Dr)

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	0	PM
	0	0	0	0		

EASTBOUND (Wilshire Blvd)

AM	NOON	PM	
0	371	0	
0	0	0	0
0	0	0	0
0	476	0	3
0	11	0	0
AM	NOON	PM	

WESTBOUND (Wilshire Blvd)

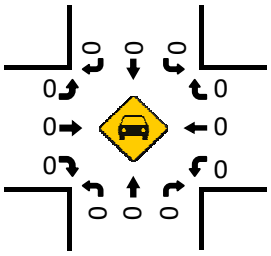
	PM	NOON	AM
0	0	0	0
2	0	370	0
1	0	0	0
0	0	0	0
	0	498	0
	PM	NOON	AM

CONTROL			
Signalized			
TEV	0 AM	880 NOON	0 PM
PHF		0.91	

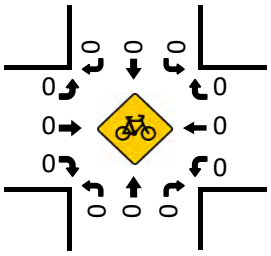
NORTHBOUND (Ogden Dr)

PM	0	0	0	0	0	PM
NOON	11	0	1	0	22	NOON
AM	0	0	0	0	0	AM
	0	1	0	1		

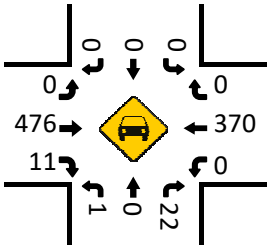
Totals (AM)



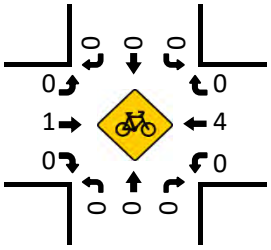
Total Bikes (AM)



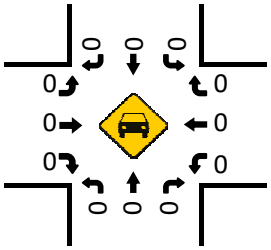
Totals (NOON)



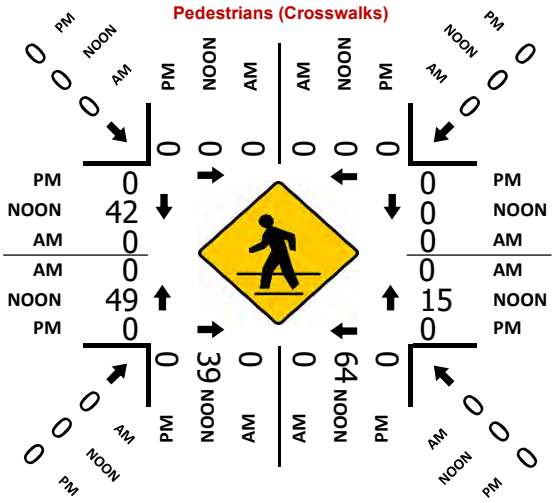
Total Bikes (NOON)



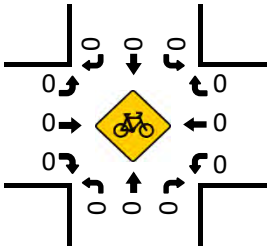
Totals (PM)



Pedestrians (Crosswalks)



Total Bikes (PM)



Prepared by National Data & Surveying Services

Spaulding Ave & Wilshire Blvd

Peak Hour Turning Movement Count

ID: 22-020152-004
City: Los Angeles

Day: Thursday
Date: 5/12/2022

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	01:00 PM - 02:00 PM
PM	04:45 PM - 05:45 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	12:00 PM - 02:00 PM
PM	4:00 PM - 06:00 PM

CONTROL: Signalized

	AM	NOON	PM
TEV	1200	1254	1810
PHF	0.93	0.93	0.95

SOUTHBOUND (Spaulding Ave)

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	0	PM

EASTBOUND (Wilshire Blvd)

AM	NOON	PM	
781	498	505	⇦
0	0	0	↶ 0
0	0	0	↱ 0
339	677	1220	→ 2
34	36	32	↷ 0

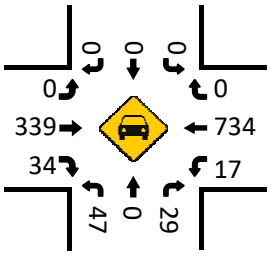
WESTBOUND (Wilshire Blvd)

PM	NOON	AM	
0	0	0	0 ↰
480	474	734	3 ←
17	19	17	1 ↶
0	0	0	0 ↱
1256	700	368	⇨

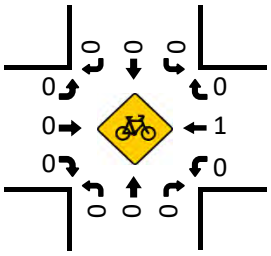
NORTHBOUND (Spaulding Ave)

PM	49	0	25	0	36	PM
NOON	56	1	24	0	23	NOON
AM	51	0	47	0	29	AM
		0	0	1	0	

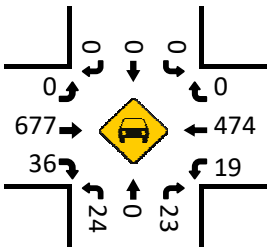
Totals (AM)



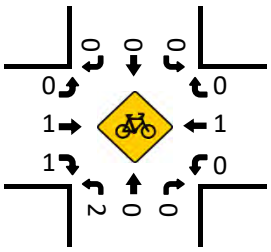
Total Bikes (AM)



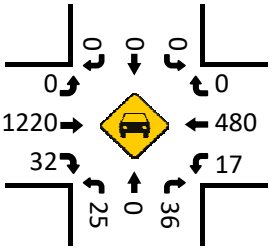
Totals (NOON)



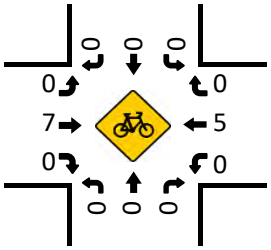
Total Bikes (NOON)



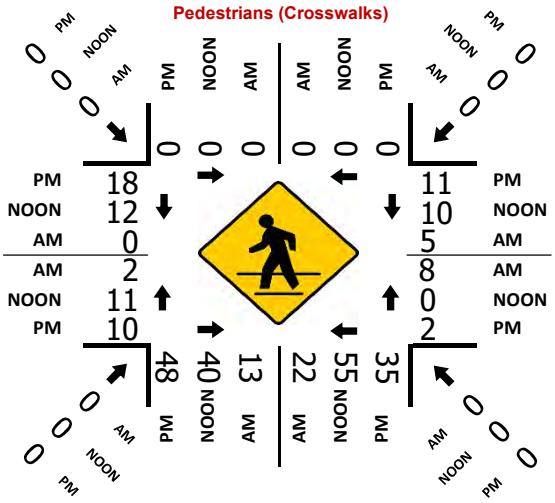
Totals (PM)



Total Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Spaulding Ave & Wilshire Blvd

Peak Hour Turning Movement Count

ID: 22-020152-004
City: Los Angeles

Day: Saturday
Date: 5/14/2022

PEAK HOURS

NONE

01:00 PM - 02:00 PM

NONE

COUNT PERIODS

NONE

12:00 PM - 02:00 PM

NONE

SOUTHBOUND (Spaulding Ave)

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	0	PM

EASTBOUND (Wilshire Blvd)

AM	NOON	PM	
0	364	0	
0	1	0	0
0	0	0	0
0	443	0	2
0	51	0	0
AM	NOON	PM	

WESTBOUND (Wilshire Blvd)

	PM	NOON	AM
0	0	0	0
3	0	339	0
1	0	26	0
0	0	0	0
	0	477	0
	PM	NOON	AM

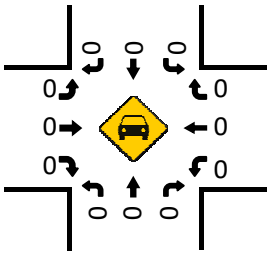
NORTHBOUND (Spaulding Ave)

PM	0	0	0	0	0	PM
NOON	77	0	24	0	34	NOON
AM	0	0	0	0	0	AM

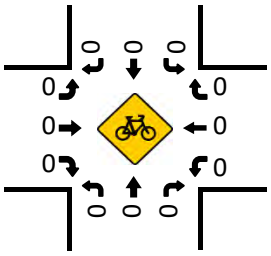
0 0 0 0 — 0 0 1 0

CONTROL			
Signalized			
TEV	0 AM	918 NOON	0 PM
PHF		0.92	

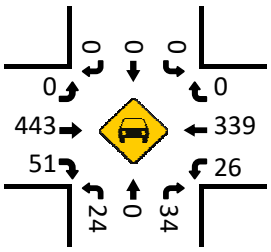
Totals (AM)



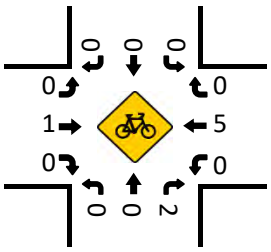
Total Bikes (AM)



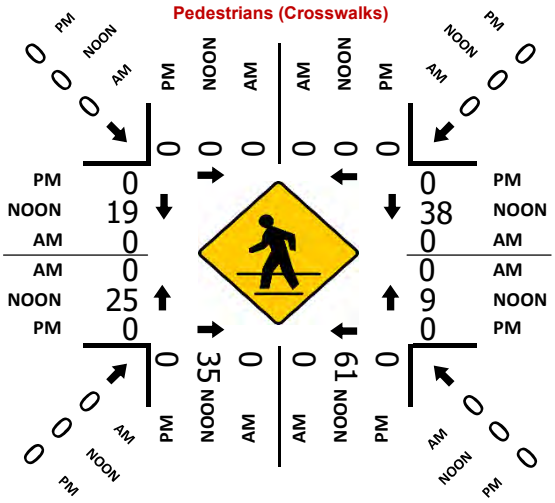
Totals (NOON)



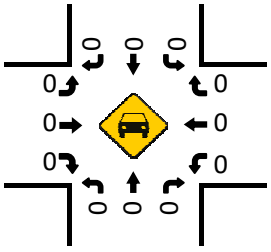
Total Bikes (NOON)



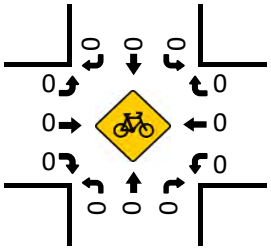
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Prepared by National Data & Surveying Services

Curson Ave & Wilshire Blvd

Peak Hour Turning Movement Count

ID: 22-020152-003
City: Los Angeles

Day: Thursday
Date: 5/12/2022

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	01:00 PM - 02:00 PM
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	12:00 PM - 02:00 PM
PM	4:00 PM - 06:00 PM

SOUTHBOUND (Curson Ave)

AM	38	158	38	0	321	AM
NOON	70	75	48	0	255	NOON
PM	44	118	40	0	338	PM
	0	1	0	0		

EASTBOUND (Wilshire Blvd)

AM	NOON	PM	
666	492	504	
2	2	2	0
36	61	108	1
372	592	1096	3
8	16	40	0

WESTBOUND (Wilshire Blvd)

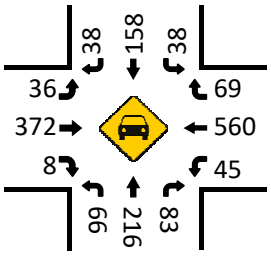
	PM	NOON	AM
0.5	64	61	69
1.5	435	389	560
1	18	14	45
0	16	11	4
	1216	710	497

NORTHBOUND (Curson Ave)

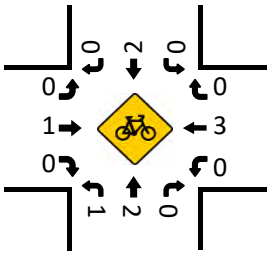
PM	176	0	23	166	64	PM
NOON	105	0	31	133	59	NOON
AM	211	0	66	216	83	AM
		0	0	1	0	

CONTROL			
Signalized			
TEV	1695 AM	1562 NOON	2234 PM
PHF	0.95	0.95	0.95

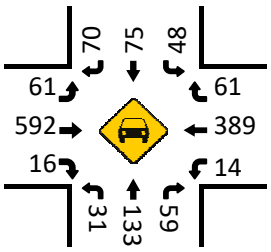
Totals (AM)



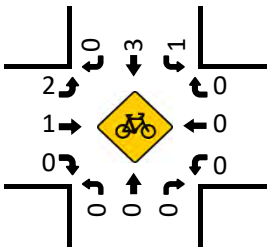
Total Bikes (AM)



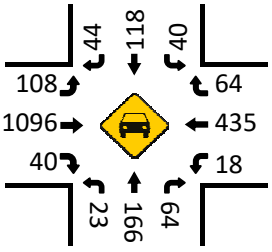
Totals (NOON)



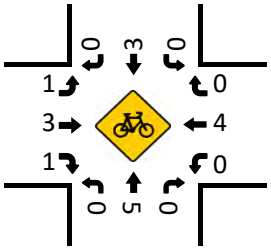
Total Bikes (NOON)



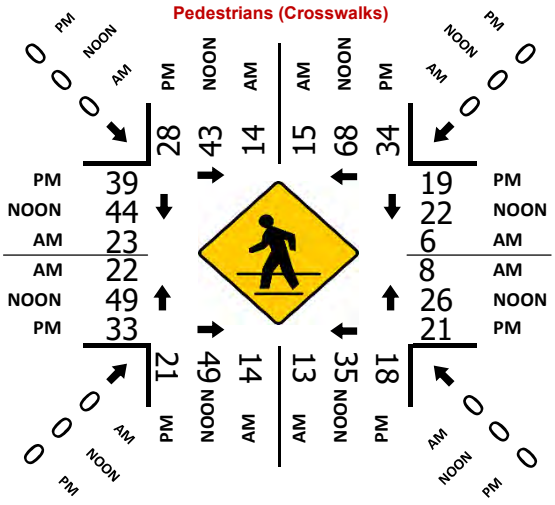
Totals (PM)



Total Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Curson Ave & Wilshire Blvd

Peak Hour Turning Movement Count

ID: 22-020152-003
City: Los Angeles

Day: Saturday
Date: 5/14/2022

PEAK HOURS

NONE

01:00 PM - 02:00 PM

NONE

COUNT PERIODS

NONE

12:00 PM - 02:00 PM

NONE

SOUTHBOUND (Curson Ave)

AM	0	0	0	0	0	AM
NOON	70	105	38	0	243	NOON
PM	0	0	0	0	0	PM

0 1 0 0

EASTBOUND (Wilshire Blvd)

AM	NOON	PM	
0	361	0	
0	4	0	0
0	57	0	1
0	401	0	3
0	14	0	0

WESTBOUND (Wilshire Blvd)

PM	NOON	AM	
0	38	0	0.5
0	264	0	1.5
0	12	0	1
0	6	0	0
0	485	0	

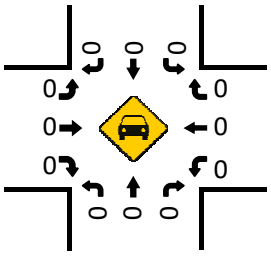
NORTHBOUND (Curson Ave)

PM	0	0	0	0	0	PM
NOON	131	0	23	148	40	NOON
AM	0	0	0	0	0	AM

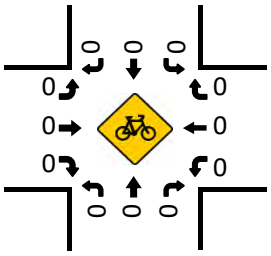
0 0 1 0

CONTROL			
Signalized			
TEV	0 AM	1220 NOON	0 PM
PHF		0.93	

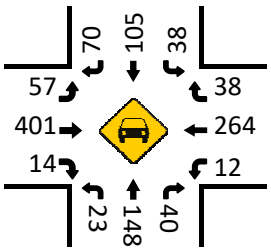
Totals (AM)



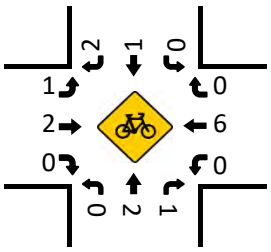
Total Bikes (AM)



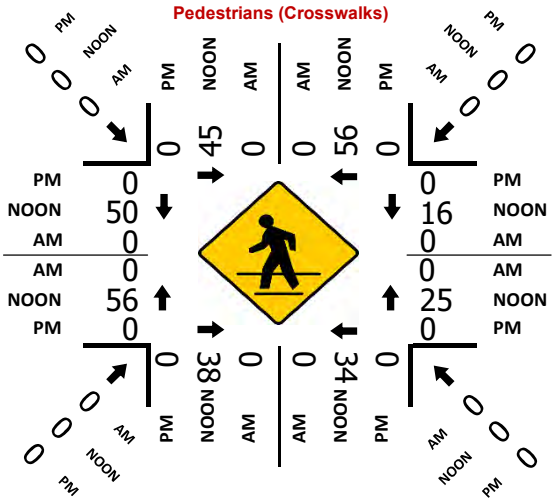
Totals (NOON)



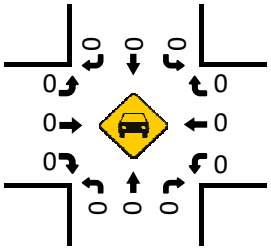
Total Bikes (NOON)



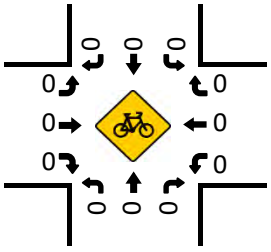
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Prepared by NDS/ATD

VOLUME

8th St Bet. Fairfax Ave & Orange Grove Ave

Day: Thursday
Date: 5/12/2022

City: Los Angeles
Project #: CA22_020153_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,648	3,695	7,343

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			3		4		7		12:00			44		41		85	
0:15			2		7		9		12:15			36		53		89	
0:30			1		6		7		12:30			47		30		77	
0:45			6	12	1	18	7	30	12:45			36	163	53	177	89	340
1:00			4		3		7		13:00			36		55		91	
1:15			4		1		5		13:15			48		44		92	
1:30			2		2		4		13:30			46		57		103	
1:45			1	11	1	7	2	18	13:45			52	182	42	198	94	380
2:00			1		0		1		14:00			60		41		101	
2:15			2		2		4		14:15			46		28		74	
2:30			2		2		4		14:30			66		34		100	
2:45			0	5	0	4	0	9	14:45			74	246	27	130	101	376
3:00			1		0		1		15:00			74		31		105	
3:15			0		0		0		15:15			79		57		136	
3:30			1		1		2		15:30			104		26		130	
3:45			1	3	1	2	2	5	15:45			93	350	36	150	129	500
4:00			2		4		6		16:00			117		25		142	
4:15			3		2		5		16:15			114		37		151	
4:30			7		4		11		16:30			140		23		163	
4:45			6	18	2	12	8	30	16:45			163	534	27	112	190	646
5:00			13		4		17		17:00			127		28		155	
5:15			8		3		11		17:15			146		36		182	
5:30			9		7		16		17:30			142		26		168	
5:45			11	41	7	21	18	62	17:45			152	567	28	118	180	685
6:00			17		12		29		18:00			120		35		155	
6:15			8		8		16		18:15			89		40		129	
6:30			8		26		34		18:30			50		27		77	
6:45			9	42	27	73	36	115	18:45			58	317	31	133	89	450
7:00			11		48		59		19:00			43		24		67	
7:15			18		101		119		19:15			43		13		56	
7:30			27		147		174		19:30			51		28		79	
7:45			39	95	156	452	195	547	19:45			53	190	21	86	74	276
8:00			47		156		203		20:00			43		26		69	
8:15			44		171		215		20:15			55		16		71	
8:30			24		196		220		20:30			39		15		54	
8:45			27	142	205	728	232	870	20:45			32	169	16	73	48	242
9:00			35		165		200		21:00			23		24		47	
9:15			23		181		204		21:15			23		12		35	
9:30			39		143		182		21:30			25		9		34	
9:45			33	130	114	603	147	733	21:45			17	88	16	61	33	149
10:00			18		73		91		22:00			16		11		27	
10:15			24		61		85		22:15			21		21		42	
10:30			21		71		92		22:30			24		16		40	
10:45			24	87	48	253	72	340	22:45			14	75	7	55	21	130
11:00			27		63		90		23:00			11		7		18	
11:15			41		62		103		23:15			11		8		19	
11:30			39		41		80		23:30			15		5		20	
11:45			29	136	37	203	66	339	23:45			8	45	6	26	14	71
TOTALS				722		2376		3098	TOTALS				2926		1319		4245
SPLIT %				23.3%		76.7%		42.2%	SPLIT %				68.9%		31.1%		57.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,648	3,695	7,343

AM Peak Hour			7:30	8:30	8:00	PM Peak Hour			16:45	12:45	16:45
AM Pk Volume			157	747	870	PM Pk Volume			578	209	695
Pk Hr Factor			0.835	0.911	0.938	Pk Hr Factor			0.887	0.917	0.914
7 - 9 Volume	0	0	237	1180	1417	4 - 6 Volume	0	0	1101	230	1331
7 - 9 Peak Hour			7:30	8:00	8:00	4 - 6 Peak Hour			16:45	17:00	16:45
7 - 9 Pk Volume	0	0	157	728	870	4 - 6 Pk Volume	0	0	578	118	695
Pk Hr Factor	0.000	0.000	0.835	0.888	0.938	Pk Hr Factor	0.000	0.000	0.887	0.819	0.914

Prepared by NDS/ATD

VOLUME

8th St Bet. Fairfax Ave & Orange Grove Ave

Day: Saturday
Date: 5/14/2022

City: Los Angeles
Project #: CA22_020153_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,252	2,528	4,780

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			10		13		23		12:00			34		51		85	
0:15			11		8		19		12:15			31		52		83	
0:30			9		17		26		12:30			36		56		92	
0:45			9	39	5	43	14	82	12:45			46	147	44	203	90	350
1:00			9		7		16		13:00			39		48		87	
1:15			13		5		18		13:15			30		43		73	
1:30			6		3		9		13:30			34		56		90	
1:45			6	34	0	15	6	49	13:45			40	143	64	211	104	354
2:00			4		0		4		14:00			40		66		106	
2:15			3		4		7		14:15			49		51		100	
2:30			3		5		8		14:30			45		66		111	
2:45			4	14	3	12	7	26	14:45			40	174	57	240	97	414
3:00			5		3		8		15:00			39		61		100	
3:15			4		3		7		15:15			45		42		87	
3:30			3		0		3		15:30			36		42		78	
3:45			5	17	1	7	6	24	15:45			37	157	43	188	80	345
4:00			4		3		7		16:00			41		39		80	
4:15			6		2		8		16:15			48		43		91	
4:30			6		7		13		16:30			31		39		70	
4:45			7	23	1	13	8	36	16:45			37	157	43	164	80	321
5:00			2		2		4		17:00			44		52		96	
5:15			1		2		3		17:15			29		41		70	
5:30			2		1		3		17:30			46		21		67	
5:45			0	5	5	10	5	15	17:45			45	164	38	152	83	316
6:00			1		4		5		18:00			39		23		62	
6:15			4		3		7		18:15			35		39		74	
6:30			4		10		14		18:30			37		36		73	
6:45			7	16	3	20	10	36	18:45			25	136	20	118	45	254
7:00			11		8		19		19:00			40		40		80	
7:15			9		9		18		19:15			45		46		91	
7:30			8		13		21		19:30			32		41		73	
7:45			9	37	12	42	21	79	19:45			42	159	38	165	80	324
8:00			10		14		24		20:00			28		32		60	
8:15			9		16		25		20:15			30		25		55	
8:30			12		18		30		20:30			25		28		53	
8:45			20	51	31	79	51	130	20:45			38	121	21	106	59	227
9:00			20		22		42		21:00			29		26		55	
9:15			32		37		69		21:15			22		17		39	
9:30			39		43		82		21:30			24		18		42	
9:45			36	127	26	128	62	255	21:45			22	97	17	78	39	175
10:00			35		33		68		22:00			18		19		37	
10:15			47		46		93		22:15			24		11		35	
10:30			32		46		78		22:30			18		23		41	
10:45			27	141	46	171	73	312	22:45			30	90	20	73	50	163
11:00			29		34		63		23:00			17		44		61	
11:15			42		39		81		23:15			21		36		57	
11:30			30		41		71		23:30			17		35		52	
11:45			38	139	40	154	78	293	23:45			9	64	21	136	30	200
TOTALS				643		694		**1337**	**TOTALS**				1609		1834		**3443**
SPLIT %				48.1%		51.9%		**28.0%**	**SPLIT %**				46.7%		53.3%		**72.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,252	2,528	4,780

AM Peak Hour			9:30	11:45	**11:45**	**PM Peak Hour**			13:45	13:45	**13:45**
AM Pk Volume			157	199	**338**	**PM Pk Volume**			174	247	**421**
Pk Hr Factor			0.835	0.888	**0.918**	**Pk Hr Factor**			0.888	0.936	**0.948**
7 - 9 Volume	0	0	88	121	**209**	**4 - 6 Volume**	0	0	321	316	**637**
7 - 9 Peak Hour			8:00	8:00	**8:00**	**4 - 6 Peak Hour**			17:00	16:15	**16:15**
7 - 9 Pk Volume	0	0	51	79	**130**	**4 - 6 Pk Volume**	0	0	164	177	**337**
Pk Hr Factor	0.000	0.000	0.638	0.637	**0.637**	**Pk Hr Factor**	0.000	0.000	0.891	0.851	**0.878**

Prepared by NDS/ATD

VOLUME

8th St Bet. Stanley Ave & Curson Ave

Day: Thursday
Date: 5/12/2022

City: Los Angeles
Project #: CA22_020153_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,684	3,141	6,825

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			4		1		5		12:00			43		34		77	
0:15			3		2		5		12:15			45		26		71	
0:30			1		7		8		12:30			34		36		70	
0:45			5	13	1	11	6	24	12:45			39	161	45	141	84	302
1:00			2		2		4		13:00			50		33		83	
1:15			1		1		2		13:15			49		35		84	
1:30			2		1		3		13:30			57		36		93	
1:45			0	5	1	5	1	10	13:45			44	200	29	133	73	333
2:00			0		0		0		14:00			62		30		92	
2:15			1		1		2		14:15			59		22		81	
2:30			2		0		2		14:30			59		48		107	
2:45			0	3	0	1	0	4	14:45			82	262	37	137	119	399
3:00			2		0		2		15:00			84		32		116	
3:15			1		1		2		15:15			82		31		113	
3:30			2		2		4		15:30			105		29		134	
3:45			0	5	1	4	1	9	15:45			108	379	38	130	146	509
4:00			2		2		4		16:00			118		35		153	
4:15			0		2		2		16:15			112		39		151	
4:30			2		2		4		16:30			123		31		154	
4:45			1	5	5	11	6	16	16:45			155	508	30	135	185	643
5:00			4		6		10		17:00			132		33		165	
5:15			5		9		14		17:15			139		33		172	
5:30			3		7		10		17:30			151		24		175	
5:45			2	14	13	35	15	49	17:45			113	535	39	129	152	664
6:00			6		8		14		18:00			125		31		156	
6:15			8		14		22		18:15			99		29		128	
6:30			15		20		35		18:30			55		25		80	
6:45			18	47	17	59	35	106	18:45			60	339	33	118	93	457
7:00			21		49		70		19:00			47		28		75	
7:15			23		67		90		19:15			45		20		65	
7:30			42		115		157		19:30			49		19		68	
7:45			47	133	125	356	172	489	19:45			30	171	14	81	44	252
8:00			68		145		213		20:00			32		22		54	
8:15			50		168		218		20:15			40		23		63	
8:30			44		188		232		20:30			24		10		34	
8:45			33	195	188	689	221	884	20:45			26	122	17	72	43	194
9:00			46		168		214		21:00			16		14		30	
9:15			41		127		168		21:15			15		12		27	
9:30			49		126		175		21:30			20		12		32	
9:45			31	167	82	503	113	670	21:45			13	64	12	50	25	114
10:00			43		48		91		22:00			12		10		22	
10:15			39		39		78		22:15			10		10		20	
10:30			38		47		85		22:30			9		6		15	
10:45			29	149	29	163	58	312	22:45			13	44	4	30	17	74
11:00			24		37		61		23:00			9		7		16	
11:15			37		29		66		23:15			7		4		11	
11:30			33		31		64		23:30			7		4		11	
11:45			42	136	31	128	73	264	23:45			4	27	5	20	9	47
TOTALS				872		1965		2837	TOTALS				2812		1176		3988
SPLIT %				30.7%		69.3%		41.6%	SPLIT %				70.5%		29.5%		58.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,684	3,141	6,825

AM Peak Hour			7:45	8:15	8:15	PM Peak Hour			16:45	12:30	16:45
AM Pk Volume			209	712	885	PM Pk Volume			577	149	697
Pk Hr Factor			0.768	0.947	0.954	Pk Hr Factor			0.931	0.828	0.942
7 - 9 Volume	0	0	328	1045	1373	4 - 6 Volume	0	0	1043	264	1307
7 - 9 Peak Hour			7:45	8:00	8:00	4 - 6 Peak Hour			16:45	16:00	16:45
7 - 9 Pk Volume	0	0	209	689	884	4 - 6 Pk Volume	0	0	577	135	697
Pk Hr Factor	0.000	0.000	0.768	0.916	0.953	Pk Hr Factor	0.000	0.000	0.931	0.865	0.942

Prepared by NDS/ATD

VOLUME

8th St Bet. Stanley Ave & Curson Ave

Day: Saturday
Date: 5/14/2022

City: Los Angeles
Project #: CA22_020153_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,910	1,504	3,414

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			6		5		11		12:00			26		31		57	
0:15			7		4		11		12:15			36		21		57	
0:30			2		10		12		12:30			37		29		66	
0:45			6	21	2	21	8	42	12:45			48	147	26	107	74	254
1:00			5		5		10		13:00			33		33		66	
1:15			5		8		13		13:15			41		23		64	
1:30			2		5		7		13:30			41		23		64	
1:45			5	17	1	19	6	36	13:45			35	150	31	110	66	260
2:00			2		1		3		14:00			37		33		70	
2:15			2		7		9		14:15			38		32		70	
2:30			2		4		6		14:30			30		24		54	
2:45			2	8	3	15	5	23	14:45			29	134	36	125	65	259
3:00			4		1		5		15:00			40		27		67	
3:15			2		4		6		15:15			47		21		68	
3:30			3		0		3		15:30			40		27		67	
3:45			2	11	3	8	5	19	15:45			32	159	25	100	57	259
4:00			1		3		4		16:00			33		28		61	
4:15			0		2		2		16:15			49		21		70	
4:30			2		3		5		16:30			38		29		67	
4:45			1	4	1	9	2	13	16:45			46	166	19	97	65	263
5:00			1		1		2		17:00			31		24		55	
5:15			1		2		3		17:15			45		25		70	
5:30			0		1		1		17:30			44		17		61	
5:45			3	5	4	8	7	13	17:45			30	150	27	93	57	243
6:00			3		2		5		18:00			43		14		57	
6:15			4		6		10		18:15			28		17		45	
6:30			1		2		3		18:30			29		26		55	
6:45			4	12	5	15	9	27	18:45			24	124	14	71	38	195
7:00			7		5		12		19:00			29		20		49	
7:15			3		6		9		19:15			23		23		46	
7:30			6		11		17		19:30			27		19		46	
7:45			13	29	23	45	36	74	19:45			24	103	16	78	40	181
8:00			10		21		31		20:00			31		14		45	
8:15			15		14		29		20:15			13		16		29	
8:30			17		13		30		20:30			19		14		33	
8:45			21	63	29	77	50	140	20:45			15	78	13	57	28	135
9:00			17		18		35		21:00			20		25		45	
9:15			25		26		51		21:15			12		11		23	
9:30			37		21		58		21:30			14		18		32	
9:45			26	105	23	88	49	193	21:45			11	57	17	71	28	128
10:00			27		41		68		22:00			15		10		25	
10:15			28		28		56		22:15			16		13		29	
10:30			40		31		71		22:30			14		7		21	
10:45			28	123	25	125	53	248	22:45			17	62	8	38	25	100
11:00			40		27		67		23:00			9		10		19	
11:15			31		21		52		23:15			15		6		21	
11:30			38		30		68		23:30			12		6		18	
11:45			33	142	22	100	55	242	23:45			4	40	5	27	9	67
TOTALS				540		530		1070	TOTALS				1370		974		2344
SPLIT %				50.5%		49.5%		31.3%	SPLIT %				58.4%		41.6%		68.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,910	1,504	3,414

AM Peak Hour			11:00	10:00	10:00	PM Peak Hour			16:00	14:00	12:30
AM Pk Volume			142	125	248	PM Pk Volume			166	125	270
Pk Hr Factor			0.888	0.762	0.873	Pk Hr Factor			0.847	0.868	0.912
7 - 9 Volume	0	0	92	122	214	4 - 6 Volume	0	0	316	190	506
7 - 9 Peak Hour			8:00	8:00	8:00	4 - 6 Peak Hour			16:00	16:00	16:00
7 - 9 Pk Volume	0	0	63	77	140	4 - 6 Pk Volume	0	0	166	97	263
Pk Hr Factor	0.000	0.000	0.750	0.664	0.700	Pk Hr Factor	0.000	0.000	0.847	0.836	0.939

Prepared by NDS/ATD

VOLUME

Orange Grove Ave Bet. Wilshire Blvd & 8th St

Day: Thursday
Date: 5/12/2022

City: Los Angeles
Project #: CA22_020153_003

DAILY TOTALS	NB	SB	EB	WB	Total
	211	576	0	0	787

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	1		2						3		12:00	1		5						6	
0:15	0		0						0		12:15	0		16						16	
0:30	0		1						1		12:30	3		15						18	
0:45	0	1	0	3					0	4	12:45	3	7	7	43					10	50
1:00	0		0						0		13:00	4		17						21	
1:15	0		0						0		13:15	5		16						21	
1:30	0		0						0		13:30	0		16						16	
1:45	0		0						0		13:45	5	14	18	67					23	81
2:00	0		0						0		14:00	0		16						16	
2:15	0		0						0		14:15	5		16						21	
2:30	0		0						0		14:30	4		16						20	
2:45	0		0						0		14:45	4	13	18	66					22	79
3:00	0		0						0		15:00	4		12						16	
3:15	0		0						0		15:15	3		23						26	
3:30	0		0						0		15:30	1		12						13	
3:45	0		0						0		15:45	3	11	15	62					18	73
4:00	0		0						0		16:00	2		14						16	
4:15	1		0						1		16:15	3		13						16	
4:30	3		2						5		16:30	2		10						12	
4:45	1	5	1	3					2	8	16:45	2	9	11	48					13	57
5:00	1		0						1		17:00	5		20						25	
5:15	1		0						1		17:15	2		11						13	
5:30	1		1						2		17:30	4		7						11	
5:45	1	4	0	1					1	5	17:45	0	11	8	46					8	57
6:00	0		1						1		18:00	1		16						17	
6:15	2		2						4		18:15	5		17						22	
6:30	0		5						5		18:30	4		16						20	
6:45	0	2	1	9					1	11	18:45	3	13	9	58					12	71
7:00	1		2						3		19:00	0		9						9	
7:15	0		1						1		19:15	1		5						6	
7:30	1		1						2		19:30	2		6						8	
7:45	3	5	2	6					5	11	19:45	3	6	1	21					4	27
8:00	13		6						19		20:00	4		9						13	
8:15	10		6						16		20:15	5		2						7	
8:30	11		3						14		20:30	2		3						5	
8:45	13	47	10	25					23	72	20:45	0	11	6	20					6	31
9:00	10		6						16		21:00	1		5						6	
9:15	3		0						3		21:15	0		1						1	
9:30	4		6						10		21:30	3		1						4	
9:45	5	22	7	19					12	41	21:45	4	8	7	14					11	22
10:00	2		3						5		22:00	0		2						2	
10:15	3		11						14		22:15	0		5						5	
10:30	4		2						6		22:30	1		9						10	
10:45	2	11	2	18					4	29	22:45	1	2	2	18					3	20
11:00	2		3						5		23:00	0		0						0	
11:15	2		11						13		23:15	1		3						4	
11:30	2		3						5		23:30	1		2						3	
11:45	1	7	7	24					8	31	23:45	0	2	0	5					0	7
TOTALS		104		108						**212**	**TOTALS**		107		468						**575**
SPLIT %		49.1%		50.9%						**26.9%**	**SPLIT %**		18.6%		81.4%						**73.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	211	576	0	0	787

AM Peak Hour	8:00	11:45			**8:00**	**PM Peak Hour**	14:15	14:30			**14:30**
AM Pk Volume	47	43			**72**	**PM Pk Volume**	17	69			**84**
Pk Hr Factor	0.904	0.672			**0.783**	**Pk Hr Factor**	0.850	0.750			**0.808**
7 - 9 Volume	52	31	0	0	**83**	**4 - 6 Volume**	20	94	0	0	**114**
7 - 9 Peak Hour	8:00	8:00			**8:00**	**4 - 6 Peak Hour**	16:45	16:15			**16:15**
7 - 9 Pk Volume	47	25	0	0	**72**	**4 - 6 Pk Volume**	13	54	0	0	**66**
Pk Hr Factor	0.904	0.625	0.000	0.000	**0.783**	**Pk Hr Factor**	0.650	0.675	0.000	0.000	**0.660**

Prepared by NDS/ATD

VOLUME

Orange Grove Ave Bet. Wilshire Blvd & 8th St

Day: Saturday
Date: 5/14/2022

City: Los Angeles
Project #: CA22_020153_003

DAILY TOTALS	NB	SB	EB	WB	Total
	225	929	0	0	1,154

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	0		2						2		12:00	3		17						20	
0:15	2		1						3		12:15	2		25						27	
0:30	0		1						1		12:30	2		20						22	
0:45	2	4	1	5					3	9	12:45	3	10	21	83					24	93
1:00	0		1						1		13:00	1		14						15	
1:15	0		1						1		13:15	2		16						18	
1:30	1		0						1		13:30	2		15						17	
1:45	0	1	1	3					1	4	13:45	5	10	26	71					31	81
2:00	0		0						0		14:00	4		17						21	
2:15	2		0						2		14:15	4		22						26	
2:30	1		0						1		14:30	8		30						38	
2:45	0	3	1	1					1	4	14:45	4	20	22	91					26	111
3:00	0		0						0		15:00	4		23						27	
3:15	0		0						0		15:15	3		16						19	
3:30	0		0						0		15:30	3		25						28	
3:45	0		1	1					1	1	15:45	4	14	17	81					21	95
4:00	1		0						1		16:00	4		14						18	
4:15	0		2						2		16:15	5		21						26	
4:30	2		2						4		16:30	3		18						21	
4:45	0	3	0	4					0	7	16:45	4	16	31	84					35	100
5:00	0		0						0		17:00	4		33						37	
5:15	0		0						0		17:15	2		22						24	
5:30	0		0						0		17:30	3		12						15	
5:45	0		0						0		17:45	5	14	10	77					15	91
6:00	0		0						0		18:00	2		8						10	
6:15	0		1						1		18:15	2		21						23	
6:30	0		3						3		18:30	7		13						20	
6:45	0		0	4					0	4	18:45	4	15	7	49					11	64
7:00	0		0						0		19:00	7		19						26	
7:15	2		1						3		19:15	6		28						34	
7:30	0		0						0		19:30	5		18						23	
7:45	0	2	1	2					1	4	19:45	3	21	13	78					16	99
8:00	0		0						0		20:00	2		14						16	
8:15	1		4						5		20:15	5		14						19	
8:30	1		2						3		20:30	6		8						14	
8:45	3	5	4	10					7	15	20:45	0	13	3	39					3	52
9:00	1		2						3		21:00	3		6						9	
9:15	2		4						6		21:15	1		4						5	
9:30	3		9						12		21:30	3		5						8	
9:45	5	11	1	16					6	27	21:45	3	10	10	25					13	35
10:00	4		6						10		22:00	2		9						11	
10:15	3		10						13		22:15	3		4						7	
10:30	6		8						14		22:30	2		17						19	
10:45	4	17	10	34					14	51	22:45	4	11	11	41					15	52
11:00	5		12						17		23:00	2		17						19	
11:15	7		11						18		23:15	2		30						32	
11:30	3		13						16		23:30	2		24						26	
11:45	3	18	13	49					16	67	23:45	1	7	10	81					11	88
TOTALS		64		129						**193**	**TOTALS**		161		800						**961**
SPLIT %		33.2%		66.8%						**16.7%**	**SPLIT %**		16.8%		83.2%						**83.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	225	929	0	0	1,154

AM Peak Hour	10:30	11:45			**11:45**	**PM Peak Hour**	18:30	16:30			**16:15**
AM Pk Volume	22	75			**85**	**PM Pk Volume**	24	104			**119**
Pk Hr Factor	0.786	0.750			**0.787**	**Pk Hr Factor**	0.857	0.788			**0.804**
7 - 9 Volume	7	12	0	0	**19**	**4 - 6 Volume**	30	161	0	0	**191**
7 - 9 Peak Hour	8:00	8:00			**8:00**	**4 - 6 Peak Hour**	16:00	16:30			**16:15**
7 - 9 Pk Volume	5	10	0	0	**15**	**4 - 6 Pk Volume**	16	104	0	0	**119**
Pk Hr Factor	0.417	0.625	0.000	0.000	**0.536**	**Pk Hr Factor**	0.800	0.788	0.000	0.000	**0.804**

Prepared by NDS/ATD

VOLUME

Ogden Dr Bet. Wilshire Blvd & 8th st

Day: Thursday
Date: 5/12/2022

City: Los Angeles
Project #: CA22_020153_004

DAILY TOTALS	NB	SB	EB	WB	Total
	173	222	0	0	395

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	0		1						1		12:00	0		0						0	
0:15	2		0						2		12:15	0		1						1	
0:30	0		0						0		12:30	0		0						0	
0:45	0	2	0	1					0	3	12:45	2	2	0	1					2	3
1:00	0		0						0		13:00	0		0						0	
1:15	0		0						0		13:15	1		1						2	
1:30	1		0						1		13:30	4		2						6	
1:45	0	1	0						0	1	13:45	5	10	1	4					6	14
2:00	0		0						0		14:00	5		6						11	
2:15	2		0						2		14:15	2		8						10	
2:30	0		0						0		14:30	3		6						9	
2:45	0	2	0						0	2	14:45	2	12	1	21					3	33
3:00	0		0						0		15:00	2		8						10	
3:15	0		1						1		15:15	8		5						13	
3:30	0		0						0		15:30	4		2						6	
3:45	1	1	0	1					1	2	15:45	3	17	11	26					14	43
4:00	1		1						2		16:00	4		3						7	
4:15	2		1						3		16:15	2		7						9	
4:30	0		1						1		16:30	6		5						11	
4:45	3	6	0	3					3	9	16:45	4	16	6	21					10	37
5:00	3		2						5		17:00	6		11						17	
5:15	4		2						6		17:15	3		4						7	
5:30	0		1						1		17:30	2		5						7	
5:45	0	7	1	6					1	13	17:45	4	15	4	24					8	39
6:00	0		0						0		18:00	6		10						16	
6:15	0		0						0		18:15	4		4						8	
6:30	0		0						0		18:30	4		6						10	
6:45	0		0						0		18:45	2	16	4	24					6	40
7:00	0		0						0		19:00	2		6						8	
7:15	0		0						0		19:15	3		8						11	
7:30	0		0						0		19:30	1		7						8	
7:45	0		0						0		19:45	2	8	7	28					9	36
8:00	1		0						1		20:00	3		5						8	
8:15	2		1						3		20:15	3		5						8	
8:30	1		0						1		20:30	4		5						9	
8:45	1	5	0	1					1	6	20:45	7	17	7	22					14	39
9:00	1		0						1		21:00	2		3						5	
9:15	0		1						1		21:15	4		3						7	
9:30	1		0						1		21:30	4		4						8	
9:45	0	2	1	2					1	4	21:45	4	14	2	12					6	26
10:00	1		0						1		22:00	4		2						6	
10:15	0		0						0		22:15	4		4						8	
10:30	0		0						0		22:30	2		4						6	
10:45	1	2	0						1	2	22:45	2	12	5	15					7	27
11:00	1		0						1		23:00	0		2						2	
11:15	0		0						0		23:15	3		6						9	
11:30	1		0						1		23:30	1		1						2	
11:45	0	2	0						0	2	23:45	0	4	1	10					1	14
TOTALS		30		14						44	TOTALS		143		208						351
SPLIT %		68.2%		31.8%						11.1%	SPLIT %		40.7%		59.3%						88.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	173	222	0	0	395

AM Peak Hour	4:30	5:00			4:30	PM Peak Hour	15:15	16:15			16:15
AM Pk Volume	10	6			15	PM Pk Volume	19	29			47
Pk Hr Factor	0.625	0.750			0.625	Pk Hr Factor	0.594	0.659			0.691
7 - 9 Volume	5	1	0	0	6	4 - 6 Volume	31	45	0	0	76
7 - 9 Peak Hour	8:00	7:30			8:00	4 - 6 Peak Hour	16:30	16:15			16:15
7 - 9 Pk Volume	5	1	0	0	6	4 - 6 Pk Volume	19	29	0	0	47
Pk Hr Factor	0.625	0.250	0.000	0.000	0.500	Pk Hr Factor	0.792	0.659	0.000	0.000	0.691

Prepared by NDS/ATD

VOLUME

Ogden Dr Bet. Wilshire Blvd & 8th st

Day: Saturday
Date: 5/14/2022

City: Los Angeles
Project #: CA22_020153_004

DAILY TOTALS	NB	SB	EB	WB	Total
	297	389	0	0	686

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	2		4						6		12:00	2		5						7	
0:15	2		1						3		12:15	4		3						7	
0:30	0		1						1		12:30	2		8						10	
0:45	0	4	1	7					1	11	12:45	4	12	6	22					10	34
1:00	1		0						1		13:00	3		8						11	
1:15	0		1						1		13:15	6		6						12	
1:30	3		1						4		13:30	5		4						9	
1:45	1	5	1	3					2	8	13:45	7	21	7	25					14	46
2:00	0		0						0		14:00	3		9						12	
2:15	0		3						3		14:15	7		5						12	
2:30	1		2						3		14:30	5		6						11	
2:45	1	2	0	5					1	7	14:45	3	18	5	25					8	43
3:00	1		0						1		15:00	8		10						18	
3:15	0		0						0		15:15	4		7						11	
3:30	0		0						0		15:30	5		11						16	
3:45	0	1	0						0	1	15:45	6	23	9	37					15	60
4:00	4		1						5		16:00	3		7						10	
4:15	8		1						9		16:15	1		10						11	
4:30	4		0						4		16:30	9		8						17	
4:45	3	19	0	2					3	21	16:45	7	20	13	38					20	58
5:00	1		0						1		17:00	1		8						9	
5:15	0		0						0		17:15	4		7						11	
5:30	1		0						1		17:30	5		2						7	
5:45	0	2	0						0	2	17:45	2	12	5	22					7	34
6:00	0		0						0		18:00	6		1						7	
6:15	1		1						2		18:15	3		5						8	
6:30	2		1						3		18:30	6		7						13	
6:45	1	4	1	3					2	7	18:45	7	22	6	19					13	41
7:00	2		1						3		19:00	5		15						20	
7:15	1		1						2		19:15	6		6						12	
7:30	2		0						2		19:30	3		5						8	
7:45	1	6	0	2					1	8	19:45	5	19	4	30					9	49
8:00	1		1						2		20:00	7		11						18	
8:15	1		1						2		20:15	3		3						6	
8:30	2		2						4		20:30	3		7						10	
8:45	5	9	2	6					7	15	20:45	2	15	4	25					6	40
9:00	1		3						4		21:00	1		10						11	
9:15	1		0						1		21:15	3		7						10	
9:30	6		3						9		21:30	3		6						9	
9:45	4	12	2	8					6	20	21:45	0	7	8	31					8	38
10:00	6		2						8		22:00	2		3						5	
10:15	3		9						12		22:15	4		5						9	
10:30	5		12						17		22:30	3		3						6	
10:45	8	22	9	32					17	54	22:45	3	12	4	15					7	27
11:00	10		7						17		23:00	2		1						3	
11:15	7		6						13		23:15	2		5						7	
11:30	3		6						9		23:30	1		3						4	
11:45	5	25	3	22					8	47	23:45	0	5	1	10					1	15
TOTALS		111		90						**201**	**TOTALS**		186		299						**485**
SPLIT %		55.2%		44.8%						**29.3%**	**SPLIT %**		38.4%		61.6%						**70.7%**

DAILY TOTALS	NB	SB	EB	WB	Total
	297	389	0	0	686

AM Peak Hour	10:30	10:15			**10:30**	**PM Peak Hour**	18:30	16:15			**15:00**
AM Pk Volume	30	37			**64**	**PM Pk Volume**	24	39			**60**
Pk Hr Factor	0.750	0.771			**0.941**	**Pk Hr Factor**	0.857	0.750			**0.833**
7 - 9 Volume	15	8	0	0	**23**	**4 - 6 Volume**	32	60	0	0	**92**
7 - 9 Peak Hour	8:00	8:00			**8:00**	**4 - 6 Peak Hour**	16:30	16:15			**16:00**
7 - 9 Pk Volume	9	6	0	0	**15**	**4 - 6 Pk Volume**	21	39	0	0	**58**
Pk Hr Factor	0.450	0.750	0.000	0.000	**0.536**	**Pk Hr Factor**	0.583	0.750	0.000	0.000	**0.725**

Prepared by NDS/ATD

VOLUME

Spaulding Ave Bet. Wilshire Blvd & 8th St

Day: Thursday
Date: 5/12/2022

City: Los Angeles
Project #: CA22_020153_005

DAILY TOTALS	NB	SB	EB	WB	Total
	758	720	0	0	1,478

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	0		5						5		12:00	11		11						22	
0:15	1		7						8		12:15	11		22						33	
0:30	0		3						3		12:30	10		11						21	
0:45	1	2	1	16					2	18	12:45	10	42	9	53					19	95
1:00	1		2						3		13:00	5		13						18	
1:15	1		0						1		13:15	15		8						23	
1:30	0		0						0		13:30	6		13						19	
1:45	0	2	0	2					0	4	13:45	11	37	14	48					25	85
2:00	0		0						0		14:00	9		16						25	
2:15	0		0						0		14:15	9		8						17	
2:30	0		0						0		14:30	13		8						21	
2:45	0		0						0		14:45	10	41	14	46					24	87
3:00	0		0						0		15:00	17		12						29	
3:15	0		1						1		15:15	11		14						25	
3:30	0		4						4		15:30	9		23						32	
3:45	1	1	0	5					1	6	15:45	12	49	17	66					29	115
4:00	1		0						1		16:00	7		9						16	
4:15	0		0						0		16:15	6		13						19	
4:30	1		0						1		16:30	14		10						24	
4:45	3	5	1	1					4	6	16:45	6	33	13	45					19	78
5:00	3		0						3		17:00	12		16						28	
5:15	8		0						8		17:15	5		17						22	
5:30	3		0						3		17:30	9		14						23	
5:45	11	25	2	2					13	27	17:45	10	36	12	59					22	95
6:00	16		8						24		18:00	5		8						13	
6:15	11		4						15		18:15	4		11						15	
6:30	10		5						15		18:30	8		11						19	
6:45	12	49	4	21					16	70	18:45	11	28	15	45					26	73
7:00	9		6						15		19:00	9		8						17	
7:15	16		10						26		19:15	8		9						17	
7:30	18		6						24		19:30	3		7						10	
7:45	22	65	11	33					33	98	19:45	3	23	10	34					13	57
8:00	22		10						32		20:00	4		11						15	
8:15	25		15						40		20:15	6		8						14	
8:30	32		11						43		20:30	7		7						14	
8:45	23	102	8	44					31	146	20:45	7	24	2	28					9	52
9:00	26		13						39		21:00	6		7						13	
9:15	20		14						34		21:15	1		2						3	
9:30	18		11						29		21:30	2		6						8	
9:45	17	81	10	48					27	129	21:45	3	12	2	17					5	29
10:00	8		8						16		22:00	3		6						9	
10:15	13		13						26		22:15	1		2						3	
10:30	13		6						19		22:30	2		4						6	
10:45	10	44	11	38					21	82	22:45	1	7	2	14					3	21
11:00	14		12						26		23:00	0		2						2	
11:15	15		9						24		23:15	0		4						4	
11:30	12		8						20		23:30	2		3						5	
11:45	7	48	16	45					23	93	23:45	0	2	1	10					1	12
TOTALS		424		255						**679**	**TOTALS**		334		465						**799**
SPLIT %		62.4%		37.6%						**45.9%**	**SPLIT %**		41.8%		58.2%						**54.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	758	720	0	0	1,478

AM Peak Hour	8:15	11:45			**8:15**	**PM Peak Hour**	14:30	15:00			**15:00**
AM Pk Volume	106	60			**153**	**PM Pk Volume**	51	66			**115**
Pk Hr Factor	0.828	0.682			**0.890**	**Pk Hr Factor**	0.750	0.717			**0.898**
7 - 9 Volume	167	77	0	0	**244**	**4 - 6 Volume**	69	104	0	0	**173**
7 - 9 Peak Hour	8:00	7:45			**7:45**	**4 - 6 Peak Hour**	16:15	16:45			**17:00**
7 - 9 Pk Volume	102	47	0	0	**148**	**4 - 6 Pk Volume**	38	60	0	0	**95**
Pk Hr Factor	0.797	0.783	0.000	0.000	**0.860**	**Pk Hr Factor**	0.679	0.882	0.000	0.000	**0.848**

Prepared by NDS/ATD

VOLUME

Spaulding Ave Bet. Wilshire Blvd & 8th St

Day: Saturday
Date: 5/14/2022

City: Los Angeles
Project #: CA22_020153_005

DAILY TOTALS	NB	SB	EB	WB	Total
	464	547	0	0	1,011

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	0		3						3		12:00	9		11						20	
0:15	3		6						9		12:15	7		11						18	
0:30	0		2						2		12:30	14		13						27	
0:45	2	5	2	13					4	18	12:45	10	40	17	52					27	92
1:00	1		2						3		13:00	15		14						29	
1:15	0		1						1		13:15	13		18						31	
1:30	3		1						4		13:30	13		18						31	
1:45	0	4	1	5					1	9	13:45	7	48	21	71					28	119
2:00	1		1						2		14:00	11		11						22	
2:15	0		0						0		14:15	12		12						24	
2:30	0		1						1		14:30	8		16						24	
2:45	0	1	0	2					0	3	14:45	11	42	14	53					25	95
3:00	1		0						1		15:00	12		11						23	
3:15	2		2						4		15:15	8		16						24	
3:30	0		5						5		15:30	9		9						18	
3:45	1	4	0	7					1	11	15:45	8	37	5	41					13	78
4:00	0		0						0		16:00	6		4						10	
4:15	0		0						0		16:15	11		15						26	
4:30	2		1						3		16:30	8		7						15	
4:45	0	2	0	1					0	3	16:45	4	29	8	34					12	63
5:00	1		2						3		17:00	6		9						15	
5:15	2		1						3		17:15	8		3						11	
5:30	0		0						0		17:30	5		12						17	
5:45	1	4	0	3					1	7	17:45	3	22	7	31					10	53
6:00	1		1						2		18:00	4		5						9	
6:15	1		0						1		18:15	5		4						9	
6:30	0		0						0		18:30	3		9						12	
6:45	3	5	1	2					4	7	18:45	7	19	4	22					11	41
7:00	4		2						6		19:00	5		7						12	
7:15	3		2						5		19:15	1		6						7	
7:30	7		0						7		19:30	3		4						7	
7:45	5	19	2	6					7	25	19:45	6	15	10	27					16	42
8:00	6		2						8		20:00	6		8						14	
8:15	6		5						11		20:15	4		9						13	
8:30	8		2						10		20:30	1		6						7	
8:45	11	31	4	13					15	44	20:45	8	19	7	30					15	49
9:00	5		2						7		21:00	6		5						11	
9:15	5		6						11		21:15	2		5						7	
9:30	9		4						13		21:30	3		9						12	
9:45	11	30	8	20					19	50	21:45	2	13	2	21					4	34
10:00	8		6						14		22:00	2		6						8	
10:15	8		6						14		22:15	1		4						5	
10:30	9		17						26		22:30	4		1						5	
10:45	3	28	4	33					7	61	22:45	1	8	2	13					3	21
11:00	6		12						18		23:00	3		6						9	
11:15	7		5						12		23:15	5		3						8	
11:30	7		5						12		23:30	3		5						8	
11:45	7	27	8	30					15	57	23:45	1	12	3	17					4	29
TOTALS		160		135						**295**	**TOTALS**		304		412						**716**
SPLIT %		54.2%		45.8%						**29.2%**	**SPLIT %**		42.5%		57.5%						**70.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	464	547	0	0	1,011

AM Peak Hour	11:45	11:45			**11:45**	**PM Peak Hour**	12:30	13:00			**13:00**
AM Pk Volume	37	43			**80**	**PM Pk Volume**	52	71			**119**
Pk Hr Factor	0.661	0.827			**0.741**	**Pk Hr Factor**	0.867	0.845			**0.960**
7 - 9 Volume	50	19	0	0	**69**	**4 - 6 Volume**	51	65	0	0	**116**
7 - 9 Peak Hour	8:00	8:00			**8:00**	**4 - 6 Peak Hour**	16:00	16:15			**16:15**
7 - 9 Pk Volume	31	13	0	0	**44**	**4 - 6 Pk Volume**	29	39	0	0	**68**
Pk Hr Factor	0.705	0.650	0.000	0.000	**0.733**	**Pk Hr Factor**	0.659	0.650	0.000	0.000	**0.654**

Prepared by NDS/ATD

VOLUME

Stanley Ave Bet. Wilshire Blvd & 8th St

Day: Thursday
Date: 5/12/2022

City: Los Angeles
Project #: CA22_020153_006

DAILY TOTALS	NB	SB	EB	WB	Total
	381	515	0	0	896

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		1						2		12:00	11		5						16	
00:15	1		0						1		12:15	8		6						14	
00:30	2		0						2		12:30	7		8						15	
00:45	0	4	0	1					0	5	12:45	5	31	6	25					11	56
01:00	0		0						0		13:00	8		6						14	
01:15	0		0						0		13:15	4		18						22	
01:30	0		0						0		13:30	5		10						15	
01:45	0		0						0		13:45	6	23	10	44					16	67
02:00	0		0						0		14:00	6		12						18	
02:15	0		0						0		14:15	6		18						24	
02:30	0		0						0		14:30	6		11						17	
02:45	0		0						0		14:45	2	20	14	55					16	75
03:00	0		0						0		15:00	2		25						27	
03:15	1		0						1		15:15	2		17						19	
03:30	0		1						1		15:30	3		10						13	
03:45	0	1	0	1					0	2	15:45	6	13	10	62					16	75
04:00	1		0						1		16:00	5		12						17	
04:15	0		0						0		16:15	4		7						11	
04:30	1		0						1		16:30	3		7						10	
04:45	1	3	1	1					2	4	16:45	3	15	15	41					18	56
05:00	2		0						2		17:00	3		16						19	
05:15	1		1						2		17:15	4		6						10	
05:30	1		0						1		17:30	6		13						19	
05:45	3	7	2	3					5	10	17:45	8	21	14	49					22	70
06:00	5		3						8		18:00	3		14						17	
06:15	1		0						1		18:15	6		6						12	
06:30	2		2						4		18:30	7		13						20	
06:45	2	10	2	7					4	17	18:45	3	19	11	44					14	63
07:00	5		3						8		19:00	3		8						11	
07:15	3		4						7		19:15	1		3						4	
07:30	13		6						19		19:30	7		8						15	
07:45	9	30	3	16					12	46	19:45	3	14	6	25					9	39
08:00	6		6						12		20:00	5		3						8	
08:15	8		12						20		20:15	4		1						5	
08:30	9		6						15		20:30	3		2						5	
08:45	12	35	19	43					31	78	20:45	2	14	2	8					4	22
09:00	10		10						20		21:00	2		2						4	
09:15	9		7						16		21:15	3		4						7	
09:30	6		8						14		21:30	2		1						3	
09:45	4	29	5	30					9	59	21:45	1	8	0	7					1	15
10:00	7		7						14		22:00	1		2						3	
10:15	4		2						6		22:15	2		2						4	
10:30	13		3						16		22:30	3		0						3	
10:45	10	34	7	19					17	53	22:45	0	6	2	6					2	12
11:00	11		6						17		23:00	2		1						3	
11:15	11		8						19		23:15	1		0						1	
11:30	6		2						8		23:30	2		1						3	
11:45	7	35	9	25					16	60	23:45	4	9	1	3					5	12
TOTALS		188		146						**334**	**TOTALS**		193		369						**562**
SPLIT %		56.3%		43.7%						**37.3%**	**SPLIT %**		34.3%		65.7%						**62.7%**

DAILY TOTALS	NB	SB	EB	WB	Total
	381	515	0	0	896

AM Peak Hour	10:30	08:15			**08:15**	**PM Peak Hour**	12:00	14:15			**14:15**
AM Pk Volume	45	47			**86**	**PM Pk Volume**	31	68			**84**
Pk Hr Factor	0.865	0.618			**0.694**	**Pk Hr Factor**	0.705	0.680			**0.778**
7 - 9 Volume	65	59	0	0	**124**	**4 - 6 Volume**	36	90	0	0	**126**
7 - 9 Peak Hour	07:30	08:00			**08:00**	**4 - 6 Peak Hour**	17:00	16:45			**17:00**
7 - 9 Pk Volume	36	43	0	0	**78**	**4 - 6 Pk Volume**	21	50	0	0	**70**
Pk Hr Factor	0.692	0.566	0.000	0.000	**0.629**	**Pk Hr Factor**	0.656	0.781	0.000	0.000	**0.795**

Prepared by NDS/ATD

VOLUME

Stanley Ave Bet. Wilshire Blvd & 8th St

Day: Friday
Date: 5/14/2022

City: Los Angeles
Project #: CA22_020153_006

DAILY TOTALS	NB	SB	EB	WB	Total
	303	275	0	0	578

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		2						2		12:00	9		4						13	
00:15	0		2						2		12:15	10		5						15	
00:30	2		3						5		12:30	3		5						8	
00:45	0	2	1	8					1	10	12:45	4	26	2	16					6	42
01:00	1		1						2		13:00	4		4						8	
01:15	1		0						1		13:15	5		4						9	
01:30	1		4						5		13:30	5		5						10	
01:45	3	6	2	7					5	13	13:45	4	18	7	20					11	38
02:00	1		1						2		14:00	7		7						14	
02:15	1		0						1		14:15	5		4						9	
02:30	0		1						1		14:30	6		5						11	
02:45	1	3	0	2					1	5	14:45	7	25	3	19					10	44
03:00	1		3						4		15:00	6		6						12	
03:15	2		2						4		15:15	6		2						8	
03:30	0		0						0		15:30	4		2						6	
03:45	1	4	1	6					2	10	15:45	2	18	3	13					5	31
04:00	0		0						0		16:00	1		3						4	
04:15	0		0						0		16:15	6		5						11	
04:30	0		1						1		16:30	6		9						15	
04:45	1	1	0	1					1	2	16:45	6	19	5	22					11	41
05:00	1		0						1		17:00	3		6						9	
05:15	1		0						1		17:15	3		6						9	
05:30	0		1						1		17:30	6		3						9	
05:45	0	2	0	1					0	3	17:45	3	15	4	19					7	34
06:00	0		0						0		18:00	3		4						7	
06:15	0		0						0		18:15	6		3						9	
06:30	4		2						6		18:30	6		6						12	
06:45	0	4	0	2					0	6	18:45	4	19	10	23					14	42
07:00	0		1						1		19:00	6		4						10	
07:15	3		0						3		19:15	4		1						5	
07:30	3		2						5		19:30	7		3						10	
07:45	5	11	0	3					5	14	19:45	8	25	9	17					17	42
08:00	3		1						4		20:00	1		1						2	
08:15	0		2						2		20:15	7		2						9	
08:30	3		4						7		20:30	6		2						8	
08:45	1	7	2	9					3	16	20:45	4	18	3	8					7	26
09:00	4		2						6		21:00	1		5						6	
09:15	4		2						6		21:15	2		4						6	
09:30	3		0						3		21:30	2		3						5	
09:45	2	13	3	7					5	20	21:45	1	6	1	13					2	19
10:00	3		7						10		22:00	0		2						2	
10:15	7		1						8		22:15	4		3						7	
10:30	7		5						12		22:30	0		4						4	
10:45	8	25	4	17					12	42	22:45	1	5	3	12					4	17
11:00	5		5						10		23:00	2		1						3	
11:15	6		3						9		23:15	2		5						7	
11:30	8		9						17		23:30	3		1						4	
11:45	3	22	5	22					8	44	23:45	2	9	1	8					3	17
TOTALS		100		85						185	TOTALS		203		190						393
SPLIT %		54.1%		45.9%						32.0%	SPLIT %		51.7%		48.3%						68.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	303	275	0	0	578

AM Peak Hour	11:30	11:30			11:30	PM Peak Hour	12:00	16:30			16:15
AM Pk Volume	30	23			53	PM Pk Volume	26	26			46
Pk Hr Factor	0.750	0.639			0.779	Pk Hr Factor	0.650	0.722			0.767
7 - 9 Volume	18	12	0	0	30	4 - 6 Volume	34	41	0	0	75
7 - 9 Peak Hour	07:15	08:00			07:45	4 - 6 Peak Hour	16:15	16:30			16:15
7 - 9 Pk Volume	14	9	0	0	18	4 - 6 Pk Volume	21	26	0	0	46
Pk Hr Factor	0.700	0.563	0.000	0.000	0.643	Pk Hr Factor	0.875	0.722	0.000	0.000	0.767

Prepared by NDS/ATD

VOLUME

Curson Ave Bet. Wilshire Blvd & 8th St

Day: Thursday
Date: 5/12/2022

City: Los Angeles
Project #: CA22_020153_007

DAILY TOTALS	NB	SB	EB	WB	Total
	3,250	1,918	0	0	5,168

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		3						3		12:00	55		22						77	
00:15	1		1						2		12:15	47		23						70	
00:30	3		2						5		12:30	47		35						82	
00:45	2	6	1	7					3	13	12:45	44	193	24	104					68	297
01:00	0		2						2		13:00	60		18						78	
01:15	1		0						1		13:15	59		21						80	
01:30	0		3						3		13:30	44		30						74	
01:45	1	2	4	9					5	11	13:45	48	211	31	100					79	311
02:00	0		1						1		14:00	42		34						76	
02:15	1		4						5		14:15	46		39						85	
02:30	3		2						5		14:30	52		35						87	
02:45	0	4	0	7					0	11	14:45	47	187	43	151					90	338
03:00	0		1						1		15:00	68		32						100	
03:15	0		0						0		15:15	44		49						93	
03:30	0		1						1		15:30	36		43						79	
03:45	0		0	2					0	2	15:45	47	195	39	163					86	358
04:00	1		0						1		16:00	45		40						85	
04:15	1		0						1		16:15	53		38						91	
04:30	0		0						0		16:30	49		41						90	
04:45	1	3	1	1					2	4	16:45	59	206	36	155					95	361
05:00	3		3						6		17:00	48		47						95	
05:15	3		0						3		17:15	64		51						115	
05:30	1		3						4		17:30	55		41						96	
05:45	8	15	3	9					11	24	17:45	66	233	40	179					106	412
06:00	8		5						13		18:00	69		37						106	
06:15	10		2						12		18:15	59		25						84	
06:30	17		8						25		18:30	58		34						92	
06:45	39	74	9	24					48	98	18:45	55	241	32	128					87	369
07:00	36		11						47		19:00	59		25						84	
07:15	52		16						68		19:15	46		28						74	
07:30	64		29						93		19:30	47		18						65	
07:45	78	230	41	97					119	327	19:45	28	180	14	85					42	265
08:00	71		48						119		20:00	39		13						52	
08:15	77		56						133		20:15	43		20						63	
08:30	69		60						129		20:30	25		17						42	
08:45	74	291	61	225					135	516	20:45	22	129	8	58					30	187
09:00	65		37						102		21:00	21		10						31	
09:15	58		29						87		21:15	19		6						25	
09:30	65		22						87		21:30	12		11						23	
09:45	96	284	29	117					125	401	21:45	15	67	11	38					26	105
10:00	66		31						97		22:00	15		9						24	
10:15	48		24						72		22:15	6		8						14	
10:30	49		23						72		22:30	9		7						16	
10:45	67	230	31	109					98	339	22:45	13	43	3	27					16	70
11:00	51		24						75		23:00	4		5						9	
11:15	55		28						83		23:15	6		5						11	
11:30	49		28						77		23:30	9		6						15	
11:45	40	195	24	104					64	299	23:45	12	31	3	19					15	50
TOTALS		1334		711						2045	TOTALS		1916		1207						3123
SPLIT %		65.2%		34.8%						39.6%	SPLIT %		61.4%		38.6%						60.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,250	1,918	0	0	5,168

AM Peak Hour	07:45	08:00			08:00	PM Peak Hour	17:15	17:00			17:15
AM Pk Volume	295	225			516	PM Pk Volume	254	179			423
Pk Hr Factor	0.946	0.922			0.956	Pk Hr Factor	0.920	0.877			0.920
7 - 9 Volume	521	322	0	0	843	4 - 6 Volume	439	334	0	0	773
7 - 9 Peak Hour	07:45	08:00			08:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	295	225	0	0	516	4 - 6 Pk Volume	233	179	0	0	412
Pk Hr Factor	0.946	0.922	0.000	0.000	0.956	Pk Hr Factor	0.883	0.877	0.000	0.000	0.896

Prepared by NDS/ATD

VOLUME

Curson Ave Bet. Wilshire Blvd & 8th St

Day: Saturday
Date: 5/14/2022

City: Los Angeles
Project #: CA22_020153_007

DAILY TOTALS	NB	SB	EB	WB	Total
	2,194	1,470	0	0	3,664

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	8		2						10		12:00	64		29						93	
00:15	8		1						9		12:15	37		25						62	
00:30	6		9						15		12:30	49		28						77	
00:45	5	27	2	14					7	41	12:45	46	196	27	109					73	305
01:00	3		3						6		13:00	63		32						95	
01:15	4		3						7		13:15	51		26						77	
01:30	7		2						9		13:30	50		30						80	
01:45	2	16	1	9					3	25	13:45	40	204	42	130					82	334
02:00	2		4						6		14:00	39		48						87	
02:15	3		0						3		14:15	54		25						79	
02:30	7		5						12		14:30	44		25						69	
02:45	3	15	0	9					3	24	14:45	40	177	39	137					79	314
03:00	0		1						1		15:00	55		26						81	
03:15	0		4						4		15:15	35		25						60	
03:30	2		1						3		15:30	31		23						54	
03:45	2	4	2	8					4	12	15:45	38	159	30	104					68	263
04:00	1		1						2		16:00	37		22						59	
04:15	0		1						1		16:15	36		19						55	
04:30	1		0						1		16:30	25		32						57	
04:45	1	3	0	2					1	5	16:45	39	137	30	103					69	240
05:00	1		1						2		17:00	37		38						75	
05:15	2		1						3		17:15	37		29						66	
05:30	2		0						2		17:30	34		21						55	
05:45	3	8	3	5					6	13	17:45	37	145	17	105					54	250
06:00	5		2						7		18:00	34		13						47	
06:15	4		5						9		18:15	20		25						45	
06:30	0		4						4		18:30	26		22						48	
06:45	10	19	3	14					13	33	18:45	29	109	28	88					57	197
07:00	8		4						12		19:00	25		25						50	
07:15	6		4						10		19:15	25		22						47	
07:30	7		4						11		19:30	28		16						44	
07:45	10	31	13	25					23	56	19:45	27	105	13	76					40	181
08:00	10		10						20		20:00	19		19						38	
08:15	12		16						28		20:15	28		22						50	
08:30	27		14						41		20:30	18		13						31	
08:45	31	80	12	52					43	132	20:45	19	84	18	72					37	156
09:00	25		13						38		21:00	18		19						37	
09:15	28		15						43		21:15	13		7						20	
09:30	34		21						55		21:30	14		15						29	
09:45	42	129	26	75					68	204	21:45	13	58	15	56					28	114
10:00	41		23						64		22:00	13		17						30	
10:15	45		23						68		22:15	10		16						26	
10:30	45		16						61		22:30	11		5						16	
10:45	50	181	21	83					71	264	22:45	16	50	11	49					27	99
11:00	45		25						70		23:00	5		10						15	
11:15	42		30						72		23:15	10		8						18	
11:30	61		29						90		23:30	13		7						20	
11:45	77	225	32	116					109	341	23:45	4	32	4	29					8	61
TOTALS		738		412						1150	TOTALS		1456		1058						2514
SPLIT %		64.2%		35.8%						31.4%	SPLIT %		57.9%		42.1%						68.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	2,194	1,470	0	0	3,664

AM Peak Hour	11:15	11:15			11:15	PM Peak Hour	12:45	13:15			13:00
AM Pk Volume	244	120			364	PM Pk Volume	210	146			334
Pk Hr Factor	0.792	0.938			0.835	Pk Hr Factor	0.833	0.760			0.879
7 - 9 Volume	111	77	0	0	188	4 - 6 Volume	282	208	0	0	490
7 - 9 Peak Hour	08:00	07:45			08:00	4 - 6 Peak Hour	16:45	16:30			16:30
7 - 9 Pk Volume	80	53	0	0	132	4 - 6 Pk Volume	147	129	0	0	267
Pk Hr Factor	0.645	0.828	0.000	0.000	0.767	Pk Hr Factor	0.942	0.849	0.000	0.000	0.890

Appendix 4 — Existing (2022) Intersection LOS and Queuing Worksheets

La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Report File: H:\...\Existing_AM.pdf

Scenario 1 Existing Weekday AM
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	SB Right	0.638	6.5	A
2	Curson Ave/6th St	Signalized	HCM 6th Edition	WB Right	0.900	35.5	D
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.399	1.9	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.446	6.6	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	0.694	24.0	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	6.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.638

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	2	0	6	27	0	63	6	485	9	27	1861	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	0	6	27	0	63	6	485	9	27	1861	20
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	2	7	0	16	2	125	2	7	480	5
Total Analysis Volume [veh/h]	2	0	6	28	0	65	6	500	9	28	1919	21
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			3			3			2		
v_di, Inbound Pedestrian Volume crossing m	2			3			3			2		
v_co, Outbound Pedestrian Volume crossing	7			6			7			6		
v_ci, Inbound Pedestrian Volume crossing mi	7			6			7			6		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			3			7		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	69.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	64	0	0	64	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	8	8	73	73	73	73	73	73
g / C, Green / Cycle	0.09	0.09	0.81	0.81	0.81	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.00	0.06	0.03	0.27	0.01	0.03	0.52	0.52
s, saturation flow rate [veh/h]	1695	1537	228	1870	1542	889	1870	1861
c, Capacity [veh/h]	196	184	209	1509	1245	710	1509	1502
d1, Uniform Delay [s]	37.73	39.86	8.68	2.28	1.68	3.96	3.47	3.49
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	2.13	0.25	0.59	0.01	0.10	2.12	2.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.50	0.03	0.33	0.01	0.04	0.64	0.65
d, Delay for Lane Group [s/veh]	37.81	41.99	8.93	2.87	1.69	4.06	5.59	5.64
Lane Group LOS	D	D	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.17	2.08	0.06	1.56	0.02	0.15	4.77	4.80
50th-Percentile Queue Length [ft/ln]	4.13	52.03	1.59	39.05	0.53	3.70	119.26	120.02
95th-Percentile Queue Length [veh/ln]	0.30	3.75	0.11	2.81	0.04	0.27	8.35	8.39
95th-Percentile Queue Length [ft/ln]	7.43	93.66	2.86	70.29	0.95	6.65	208.80	209.86

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.81	37.81	37.81	41.99	41.99	41.99	8.93	2.87	1.69	4.06	5.61	5.64
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	37.81			41.99			2.92			5.59		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	6.47											
Intersection LOS	A											
Intersection V/C	0.638											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.64	34.64	34.64	34.64
I_p,int, Pedestrian LOS Score for Intersection	1.776	1.781	2.790	2.780
Crosswalk LOS	A	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	469	469	1319	1319
d_b, Bicycle Delay [s]	26.35	26.36	5.23	5.24
I_b,int, Bicycle LOS Score for Intersection	1.573	1.713	2.409	3.183
Bicycle LOS	A	A	B	C

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	35.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.900

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	354	65	95	75	128	66	21	446	74	158	1513	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	354	65	95	75	128	66	21	446	74	158	1513	80
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	93	17	25	20	34	17	6	117	19	42	398	21
Total Analysis Volume [veh/h]	373	68	100	79	135	69	22	469	78	166	1593	84
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			17			18			10		
v_di, Inbound Pedestrian Volume crossing m	10			18			17			10		
v_co, Outbound Pedestrian Volume crossing	20			9			19			8		
v_ci, Inbound Pedestrian Volume crossing mi	19			8			20			9		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	2			4			1			5		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	24.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	23	23	23	23	27	27	27	27	27	27
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.45	0.45	0.45	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.32	0.10	0.07	0.12	0.07	0.25	0.05	0.19	0.45	0.46
s, saturation flow rate [veh/h]	1157	1640	1195	1736	295	1870	1489	853	1870	1828
c, Capacity [veh/h]	415	613	439	649	120	847	675	326	847	828
d1, Uniform Delay [s]	23.97	13.11	17.27	13.34	30.01	11.99	9.45	21.45	16.31	16.42
k, delay calibration	0.30	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.94	0.24	0.19	0.27	3.34	2.60	0.35	5.60	28.99	34.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.90	0.27	0.18	0.31	0.18	0.55	0.12	0.51	0.99	1.01
d, Delay for Lane Group [s/veh]	40.91	13.35	17.47	13.61	33.35	14.59	9.79	27.04	45.30	50.41
Lane Group LOS	D	B	B	B	C	B	A	C	D	F
Critical Lane Group	Yes	No	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.09	1.45	0.81	1.79	0.41	4.53	0.58	2.52	16.37	17.29
50th-Percentile Queue Length [ft/ln]	177.33	36.26	20.29	44.76	10.36	113.28	14.47	63.10	409.20	432.33
95th-Percentile Queue Length [veh/ln]	11.46	2.61	1.46	3.22	0.75	8.02	1.04	4.54	23.00	24.31
95th-Percentile Queue Length [ft/ln]	286.53	65.27	36.52	80.56	18.65	200.55	26.05	113.58	575.07	607.68

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.91	13.35	13.35	17.47	13.61	13.61	33.35	14.59	9.79	27.04	47.72	50.41
Movement LOS	D	B	B	B	B	B	C	B	A	C	D	D
d_A, Approach Delay [s/veh]	32.35			14.69			14.66			45.98		
Approach LOS	C			B			B			D		
d_I, Intersection Delay [s/veh]	35.46											
Intersection LOS	D											
Intersection V/C	0.900											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.453	2.097	3.316	2.825
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.69	9.08	9.10
I_b,int, Bicycle LOS Score for Intersection	2.452	2.027	2.498	3.080
Bicycle LOS	B	B	B	C

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	1.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.399

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	6	3	548	6	3	1158
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	3	548	6	3	1158
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	151	2	1	318
Total Analysis Volume [veh/h]	7	3	602	7	3	1273
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		20		0	
v_di, Inbound Pedestrian Volume crossing m	0		19		0	
v_co, Outbound Pedestrian Volume crossing	20		20		19	
v_ci, Inbound Pedestrian Volume crossing mi	20		20		20	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	1		0		2	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	2	2	77	77	77	77
g / C, Green / Cycle	0.02	0.02	0.86	0.86	0.86	0.86
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.17	0.00	0.00	0.36
s, saturation flow rate [veh/h]	1175	1555	3560	1552	807	3560
c, Capacity [veh/h]	27	36	3042	1326	721	3042
d1, Uniform Delay [s]	43.17	42.99	1.15	0.96	1.91	1.48
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.82	0.97	0.15	0.01	0.01	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.26	0.08	0.20	0.01	0.00	0.42
d, Delay for Lane Group [s/veh]	47.99	43.96	1.29	0.96	1.92	1.91
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.19	0.07	0.33	0.01	0.01	0.91
50th-Percentile Queue Length [ft/ln]	4.71	1.86	8.23	0.20	0.22	22.79
95th-Percentile Queue Length [veh/ln]	0.34	0.13	0.59	0.01	0.02	1.64
95th-Percentile Queue Length [ft/ln]	8.47	3.35	14.82	0.35	0.40	41.02

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.99	43.96	1.29	0.96	1.92	1.91
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	46.78		1.29		1.91	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	1.95					
Intersection LOS	A					
Intersection V/C	0.399					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	295.73	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.950	2.668	0.000
Crosswalk LOS	A	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.39	13.40
I_b,int, Bicycle LOS Score for Intersection	1.560	2.062	2.612
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	6.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.446

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	71	44	510	51	26	1105
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	44	510	51	26	1105
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	12	137	14	7	297
Total Analysis Volume [veh/h]	76	47	548	55	28	1188
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6		1		7	
v_di, Inbound Pedestrian Volume crossing m	7		1		6	
v_co, Outbound Pedestrian Volume crossing	18		17		1	
v_ci, Inbound Pedestrian Volume crossing mi	17		18		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	12	68	68	68	68
g / C, Green / Cycle	0.13	0.75	0.75	0.75	0.75
(v / s)_i Volume / Saturation Flow Rate	0.07	0.16	0.17	0.03	0.33
s, saturation flow rate [veh/h]	1703	1870	1803	813	3560
c, Capacity [veh/h]	223	1409	1359	630	2683
d1, Uniform Delay [s]	36.63	3.25	3.28	4.89	4.10
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.31	0.35	0.38	0.13	0.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.21	0.22	0.04	0.44
d, Delay for Lane Group [s/veh]	40.95	3.60	3.66	5.02	4.63
Lane Group LOS	D	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.77	1.31	1.32	0.17	3.11
50th-Percentile Queue Length [ft/ln]	69.15	32.73	33.10	4.35	77.69
95th-Percentile Queue Length [veh/ln]	4.98	2.36	2.38	0.31	5.59
95th-Percentile Queue Length [ft/ln]	124.47	58.91	59.58	7.83	139.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.95	40.95	3.63	3.66	5.02	4.63
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	40.95		3.63		4.64	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	6.62					
Intersection LOS	A					
Intersection V/C	0.446					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	1.855	2.586	2.747
Crosswalk LOS	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.17	11.14	11.15
I_b,int, Bicycle LOS Score for Intersection	1.763	2.057	2.563
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	99	325	125	57	238	57	57	560	12	74	843	104
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	90
Total Hourly Volume [veh/h]	99	325	125	57	238	57	57	560	12	74	843	14
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	86	33	15	63	15	15	147	3	19	222	4
Total Analysis Volume [veh/h]	104	342	132	60	251	60	60	589	13	78	887	15
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	7			22			23			7		
v_di, Inbound Pedestrian Volume crossing m	7			23			22			7		
v_co, Outbound Pedestrian Volume crossing	14			15			13			14		
v_ci, Inbound Pedestrian Volume crossing mi	13			14			14			15		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			4			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.38	0.27	0.10	0.16	0.16	0.10	0.25	0.01
s, saturation flow rate [veh/h]	1510	1394	618	1870	1851	814	3560	1509
c, Capacity [veh/h]	623	578	274	938	928	392	1786	757
d1, Uniform Delay [s]	27.85	22.00	23.38	13.31	13.32	18.93	14.87	11.27
k, delay calibration	0.43	0.21	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	19.58	2.30	1.83	0.91	0.92	1.14	0.99	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.93	0.64	0.22	0.32	0.32	0.20	0.50	0.02
d, Delay for Lane Group [s/veh]	47.43	24.30	25.21	14.22	14.24	20.06	15.86	11.32
Lane Group LOS	D	C	C	B	B	C	B	B
Critical Lane Group	Yes	No	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	15.22	6.40	1.09	3.68	3.66	1.21	5.90	0.16
50th-Percentile Queue Length [ft/ln]	380.45	159.92	27.14	92.12	91.62	30.13	147.49	3.88
95th-Percentile Queue Length [veh/ln]	21.62	10.54	1.95	6.63	6.60	2.17	9.88	0.28
95th-Percentile Queue Length [ft/ln]	540.40	263.61	48.85	165.82	164.91	54.24	247.07	6.98

Movement, Approach, & Intersection Results

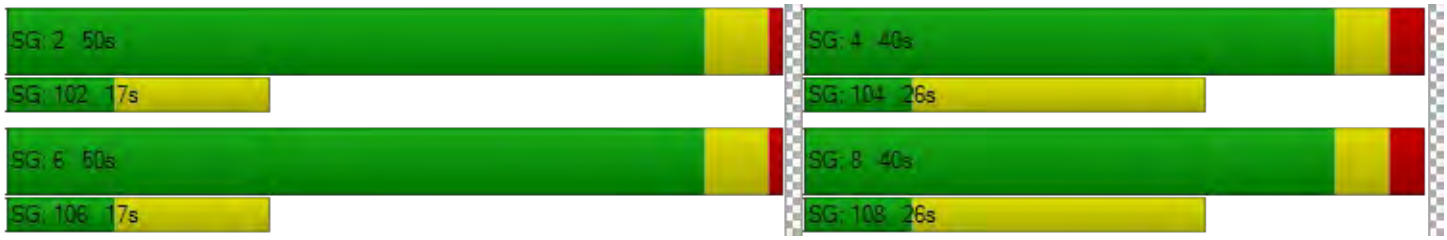
d_M, Delay for Movement [s/veh]	47.43	47.43	47.43	24.30	24.30	24.30	25.21	14.23	14.24	20.06	15.86	11.32
Movement LOS	D	D	D	C	C	C	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	47.43			24.30			15.23			16.12		
Approach LOS	D			C			B			B		
d_I, Intersection Delay [s/veh]	24.05											
Intersection LOS	C											
Intersection V/C	0.694											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.64	34.64	34.64	34.64
I_p,int, Pedestrian LOS Score for Intersection	2.274	2.228	2.781	2.966
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	765	1003	1003
d_b, Bicycle Delay [s]	17.17	17.18	11.18	11.19
I_b,int, Bicycle LOS Score for Intersection	2.513	2.172	2.106	2.442
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

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Report File: H:\...\Existing_Midday.pdf

Scenario 2 Existing Weekday Midday
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	NB Right	0.547	6.5	A
2	Curson Ave/6th St	Signalized	HCM 6th Edition	SB Left	0.425	10.5	B
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.328	2.6	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.358	5.0	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	SB Thru	0.469	15.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	6.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.547

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	31	1	44	8	0	15	9	737	49	39	868	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	1	44	8	0	15	9	737	49	39	868	9
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	12	2	0	4	2	196	13	10	231	2
Total Analysis Volume [veh/h]	33	1	47	9	0	16	10	784	52	41	923	10
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			4			4			13		
v_di, Inbound Pedestrian Volume crossing m	13			4			4			12		
v_co, Outbound Pedestrian Volume crossing	32			15			32			14		
v_ci, Inbound Pedestrian Volume crossing mi	32			14			32			15		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	2.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	8	8	42	42	42	42	42	42
g / C, Green / Cycle	0.14	0.14	0.70	0.70	0.70	0.70	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.05	0.02	0.02	0.42	0.04	0.06	0.25	0.25
s, saturation flow rate [veh/h]	1476	1556	599	1870	1486	657	1870	1861
c, Capacity [veh/h]	291	299	450	1309	1040	400	1309	1303
d1, Uniform Delay [s]	23.37	22.53	6.16	4.65	2.79	10.51	3.60	3.60
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.51	0.12	0.09	2.03	0.09	0.51	0.76	0.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.08	0.02	0.60	0.05	0.10	0.36	0.36
d, Delay for Lane Group [s/veh]	23.89	22.65	6.25	6.68	2.88	11.02	4.36	4.37
Lane Group LOS	C	C	A	A	A	B	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	1.02	0.30	0.06	3.56	0.14	0.35	1.58	1.57
50th-Percentile Queue Length [ft/ln]	25.52	7.53	1.45	88.96	3.47	8.69	39.47	39.37
95th-Percentile Queue Length [veh/ln]	1.84	0.54	0.10	6.41	0.25	0.63	2.84	2.83
95th-Percentile Queue Length [ft/ln]	45.93	13.55	2.61	160.13	6.24	15.63	71.04	70.86

Movement, Approach, & Intersection Results

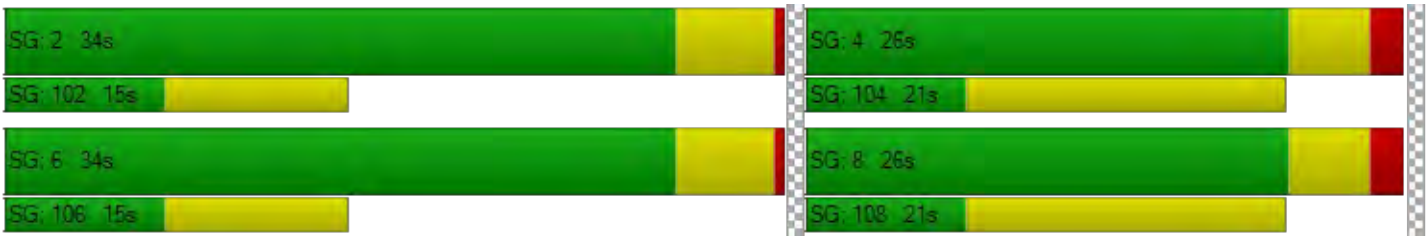
d_M, Delay for Movement [s/veh]	23.89	23.89	23.89	22.65	22.65	22.65	6.25	6.68	2.88	11.02	4.36	4.37
Movement LOS	C	C	C	C	C	C	A	A	A	B	A	A
d_A, Approach Delay [s/veh]	23.89			22.65			6.44			4.64		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	6.47											
Intersection LOS	A											
Intersection V/C	0.547											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersection	1.835	1.729	2.679	2.563
Crosswalk LOS	A	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	703	703	977	977
d_b, Bicycle Delay [s]	12.61	12.62	7.86	7.86
I_b,int, Bicycle LOS Score for Intersection	1.693	1.601	2.956	2.363
Bicycle LOS	A	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.425

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	105	51	106	38	35	49	34	466	73	73	521	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	51	106	38	35	49	34	466	73	73	521	44
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	13	28	10	9	13	9	123	19	19	137	12
Total Analysis Volume [veh/h]	111	54	112	40	37	52	36	491	77	77	548	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			10			11			12		
v_di, Inbound Pedestrian Volume crossing m	12			11			10			12		
v_co, Outbound Pedestrian Volume crossing	21			14			20			14		
v_ci, Inbound Pedestrian Volume crossing mi	20			14			21			14		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			3			2			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	12	12	12	12	37	37	37	37	37	37
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.62	0.62	0.62	0.62	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.09	0.11	0.03	0.05	0.04	0.26	0.05	0.09	0.16	0.16
s, saturation flow rate [veh/h]	1277	1571	1176	1646	819	1870	1505	841	1870	1812
c, Capacity [veh/h]	331	321	264	336	505	1164	937	453	1164	1128
d1, Uniform Delay [s]	22.92	21.27	23.92	20.11	8.83	5.80	4.49	12.04	5.09	5.10
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.59	1.30	0.26	0.42	0.27	1.12	0.17	0.81	0.54	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.52	0.15	0.26	0.07	0.42	0.08	0.17	0.26	0.26
d, Delay for Lane Group [s/veh]	23.51	22.56	24.18	20.52	9.11	6.92	4.66	12.86	5.63	5.66
Lane Group LOS	C	C	C	C	A	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	1.40	2.04	0.51	1.02	0.26	2.63	0.32	0.71	1.39	1.37
50th-Percentile Queue Length [ft/ln]	34.92	51.11	12.64	25.41	6.56	65.71	8.00	17.76	34.82	34.15
95th-Percentile Queue Length [veh/ln]	2.51	3.68	0.91	1.83	0.47	4.73	0.58	1.28	2.51	2.46
95th-Percentile Queue Length [ft/ln]	62.85	91.99	22.76	45.75	11.82	118.28	14.40	31.98	62.68	61.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.51	22.56	22.56	24.18	20.52	20.52	9.11	6.92	4.66	12.86	5.64	5.66
Movement LOS	C	C	C	C	C	C	A	A	A	B	A	A
d_A, Approach Delay [s/veh]	22.94			21.66			6.76			6.47		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	10.46											
Intersection LOS	B											
Intersection V/C	0.425											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.02	20.02	20.02	18.42
I_p,int, Pedestrian LOS Score for Intersection	2.179	2.055	2.692	2.482
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.68	11.68	9.09	9.08
I_b,int, Bicycle LOS Score for Intersection	2.017	1.772	2.556	2.113
Bicycle LOS	B	A	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	2.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.328

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	5	19	946	8	4	670
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	19	946	8	4	670
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	254	2	1	180
Total Analysis Volume [veh/h]	5	20	1017	9	4	720
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		46		0	
v_di, Inbound Pedestrian Volume crossing m	0		45		0	
v_co, Outbound Pedestrian Volume crossing	59		58		45	
v_ci, Inbound Pedestrian Volume crossing mi	58		59		46	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		3		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	4	4	75	75	75	75
g / C, Green / Cycle	0.05	0.05	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.29	0.01	0.01	0.20
s, saturation flow rate [veh/h]	1149	1556	3560	1446	545	3560
c, Capacity [veh/h]	55	74	2956	1200	478	2956
d1, Uniform Delay [s]	40.99	41.33	1.82	1.30	3.29	1.63
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.72	1.94	0.32	0.01	0.03	0.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.27	0.34	0.01	0.01	0.24
d, Delay for Lane Group [s/veh]	41.70	43.27	2.13	1.32	3.33	1.82
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.12	0.46	1.09	0.02	0.02	0.69
50th-Percentile Queue Length [ft/ln]	2.90	11.60	27.23	0.40	0.49	17.20
95th-Percentile Queue Length [veh/ln]	0.21	0.84	1.96	0.03	0.04	1.24
95th-Percentile Queue Length [ft/ln]	5.22	20.88	49.01	0.72	0.89	30.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.70	43.27	2.13	1.32	3.33	1.82
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	42.96		2.13		1.83	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	2.58					
Intersection LOS	A					
Intersection V/C	0.328					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	125.68	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.958	2.641	0.000
Crosswalk LOS	A	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.97	13.41	13.39
I_b,int, Bicycle LOS Score for Intersection	1.560	2.406	2.157
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	5.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.358

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	34	31	912	49	26	639
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	31	912	49	26	639
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	8	245	13	7	172
Total Analysis Volume [veh/h]	37	33	981	53	28	687
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	5		12		5	
v_di, Inbound Pedestrian Volume crossing m	5		11		5	
v_co, Outbound Pedestrian Volume crossing	48		47		11	
v_ci, Inbound Pedestrian Volume crossing mi	47		48		12	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		2		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	10	70	70	70	70
g / C, Green / Cycle	0.11	0.77	0.77	0.77	0.77
(v / s)_i Volume / Saturation Flow Rate	0.04	0.28	0.28	0.05	0.19
s, saturation flow rate [veh/h]	1685	1870	1818	544	3560
c, Capacity [veh/h]	189	1444	1404	435	2750
d1, Uniform Delay [s]	37.00	3.22	3.26	5.74	2.89
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.46	0.69	0.75	0.28	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.36	0.37	0.06	0.25
d, Delay for Lane Group [s/veh]	39.46	3.92	4.00	6.02	3.11
Lane Group LOS	D	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.54	2.28	2.31	0.21	1.27
50th-Percentile Queue Length [ft/ln]	38.49	56.90	57.77	5.14	31.83
95th-Percentile Queue Length [veh/ln]	2.77	4.10	4.16	0.37	2.29
95th-Percentile Queue Length [ft/ln]	69.29	102.42	103.98	9.25	57.29

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.46	39.46	3.96	4.00	6.02	3.11
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	39.46		3.96		3.22	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	5.04					
Intersection LOS	A					
Intersection V/C	0.358					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	1.828	2.559	2.733
Crosswalk LOS	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.18	11.15	11.15
I_b,int, Bicycle LOS Score for Intersection	1.675	2.413	2.149
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	15.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.469

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	42	179	79	65	101	94	85	798	22	34	524	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	69
Total Hourly Volume [veh/h]	42	179	79	65	101	94	85	798	22	34	524	13
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	47	21	17	27	25	22	210	6	9	138	3
Total Analysis Volume [veh/h]	44	188	83	68	106	99	89	840	23	36	552	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	24			46			47			24		
v_di, Inbound Pedestrian Volume crossing m	24			47			46			24		
v_co, Outbound Pedestrian Volume crossing	42			56			42			55		
v_ci, Inbound Pedestrian Volume crossing mi	42			55			42			56		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			4			3			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	24	24	56	56	56	56	56	56
g / C, Green / Cycle	0.26	0.26	0.62	0.62	0.62	0.62	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.11	0.23	0.23	0.06	0.16	0.01
s, saturation flow rate [veh/h]	1646	1405	830	1870	1841	638	3560	1447
c, Capacity [veh/h]	478	419	517	1160	1142	386	2209	898
d1, Uniform Delay [s]	29.94	29.90	11.31	8.44	8.45	12.88	7.67	6.54
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.55	1.71	0.72	0.92	0.95	0.48	0.27	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.66	0.65	0.17	0.37	0.38	0.09	0.25	0.02
d, Delay for Lane Group [s/veh]	31.49	31.61	12.04	9.36	9.40	13.35	7.94	6.57
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	6.22	5.44	1.00	4.03	4.01	0.44	2.25	0.10
50th-Percentile Queue Length [ft/ln]	155.46	135.94	24.97	100.86	100.22	10.94	56.15	2.54
95th-Percentile Queue Length [veh/ln]	10.31	9.26	1.80	7.26	7.22	0.79	4.04	0.18
95th-Percentile Queue Length [ft/ln]	257.70	231.55	44.95	181.54	180.40	19.69	101.07	4.56

Movement, Approach, & Intersection Results

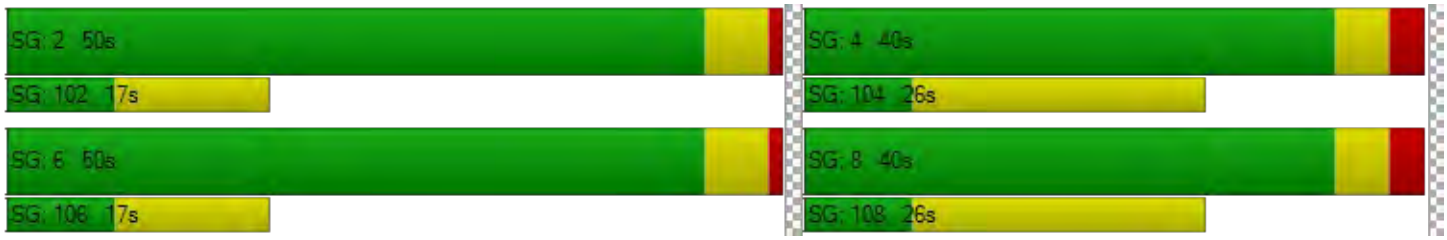
d_M, Delay for Movement [s/veh]	31.49	31.49	31.49	31.61	31.61	31.61	12.04	9.38	9.40	13.35	7.94	6.57
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	31.49			31.61			9.63			8.23		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	15.25											
Intersection LOS	B											
Intersection V/C	0.469											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	34.65	34.65	34.65
I_p,int, Pedestrian LOS Score for Intersection	2.000	2.150	2.683	2.917
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	765	1003	1003
d_b, Bicycle Delay [s]	17.16	17.19	11.20	11.19
I_b,int, Bicycle LOS Score for Intersection	2.079	2.010	2.345	2.113
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

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Report File: H:\...\Existing_PM.pdf

Scenario 3 Existing Weekday PM
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	NB Right	0.628	7.9	A
2	Curson Ave/6th St	Signalized	HCM 6th Edition	WB Left	0.789	21.8	C
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.535	4.5	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.555	6.9	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	0.672	16.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	7.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	46	0	68	13	0	24	34	857	19	14	671	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	0	68	13	0	24	34	857	19	14	671	11
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	0	18	3	0	6	9	230	5	4	180	3
Total Analysis Volume [veh/h]	49	0	73	14	0	26	37	922	20	15	722	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6			9			10			6		
v_di, Inbound Pedestrian Volume crossing m	6			10			9			6		
v_co, Outbound Pedestrian Volume crossing	16			18			16			18		
v_ci, Inbound Pedestrian Volume crossing mi	16			18			16			18		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	64	0	0	64	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	10	10	70	70	70	70	70	70
g / C, Green / Cycle	0.11	0.11	0.78	0.78	0.78	0.78	0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.08	0.02	0.05	0.49	0.01	0.03	0.20	0.20
s, saturation flow rate [veh/h]	1541	1613	720	1870	1525	595	1870	1856
c, Capacity [veh/h]	231	237	583	1458	1189	399	1458	1447
d1, Uniform Delay [s]	38.11	36.21	4.33	4.30	2.21	9.94	2.72	2.72
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.86	0.33	0.21	2.10	0.03	0.18	0.42	0.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.17	0.06	0.63	0.02	0.04	0.25	0.25
d, Delay for Lane Group [s/veh]	39.98	36.54	4.54	6.40	2.24	10.11	3.13	3.14
Lane Group LOS	D	D	A	A	A	B	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	2.66	0.81	0.22	5.60	0.06	0.15	1.37	1.36
50th-Percentile Queue Length [ft/ln]	66.51	20.30	5.39	140.01	1.54	3.84	34.14	34.00
95th-Percentile Queue Length [veh/ln]	4.79	1.46	0.39	9.48	0.11	0.28	2.46	2.45
95th-Percentile Queue Length [ft/ln]	119.72	36.55	9.71	237.04	2.77	6.91	61.45	61.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.98	39.98	39.98	36.54	36.54	36.54	4.54	6.40	2.24	10.11	3.14	3.14
Movement LOS	D	D	D	D	D	D	A	A	A	B	A	A
d_A, Approach Delay [s/veh]	39.98			36.54			6.25			3.28		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	7.89											
Intersection LOS	A											
Intersection V/C	0.628											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.64	34.64	34.64	34.64
I_p,int, Pedestrian LOS Score for Intersection	1.812	1.810	2.715	2.579
Crosswalk LOS	A	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	469	469	1319	1319
d_b, Bicycle Delay [s]	26.35	26.35	5.22	5.23
I_b,int, Bicycle LOS Score for Intersection	1.761	1.626	3.175	2.178
Bicycle LOS	A	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	21.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	87	77	268	68	66	37	47	831	65	87	563	89
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	77	268	68	66	37	47	831	65	87	563	89
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	20	69	18	17	10	12	214	17	22	145	23
Total Analysis Volume [veh/h]	90	79	276	70	68	38	48	857	67	90	580	92
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			16			16			10		
v_di, Inbound Pedestrian Volume crossing m	10			16			16			10		
v_co, Outbound Pedestrian Volume crossing	30			10			30			9		
v_ci, Inbound Pedestrian Volume crossing mi	30			9			30			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	2			1			2			5		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	17.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	20	20	20	20	30	30	30	30	30	30
g / C, Green / Cycle	0.33	0.33	0.33	0.33	0.49	0.49	0.49	0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.07	0.23	0.07	0.06	0.06	0.46	0.05	0.15	0.18	0.19
s, saturation flow rate [veh/h]	1260	1576	1014	1730	762	1870	1460	605	1870	1757
c, Capacity [veh/h]	437	527	220	579	387	920	719	147	920	865
d1, Uniform Delay [s]	18.10	17.15	26.16	14.15	13.51	14.28	8.08	29.60	9.48	9.52
k, delay calibration	0.11	0.12	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	1.72	0.82	0.15	0.66	17.07	0.26	17.56	1.16	1.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.21	0.67	0.32	0.18	0.12	0.93	0.09	0.61	0.37	0.38
d, Delay for Lane Group [s/veh]	18.33	18.87	26.98	14.30	14.17	31.36	8.34	47.16	10.64	10.78
Lane Group LOS	B	B	C	B	B	C	A	D	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.96	4.01	0.96	0.95	0.48	13.20	0.44	1.96	2.65	2.56
50th-Percentile Queue Length [ft/ln]	23.93	100.28	24.05	23.76	11.94	329.96	11.05	48.94	66.22	63.97
95th-Percentile Queue Length [veh/ln]	1.72	7.22	1.73	1.71	0.86	19.16	0.80	3.52	4.77	4.61
95th-Percentile Queue Length [ft/ln]	43.07	180.51	43.30	42.77	21.50	478.91	19.89	88.10	119.19	115.14

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	18.33	18.87	18.87	26.98	14.30	14.30	14.17	31.36	8.34	47.16	10.70	10.78
Movement LOS	B	B	B	C	B	B	B	C	A	D	B	B
d_A, Approach Delay [s/veh]	18.76			19.35			28.92			15.02		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	21.79											
Intersection LOS	C											
Intersection V/C	0.789											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.263	2.114	2.733	2.684
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.66	9.08	9.10
I_b,int, Bicycle LOS Score for Intersection	2.294	1.850	3.163	2.188
Bicycle LOS	B	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	4.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.535

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	22	31	1561	33	15	641
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	31	1561	33	15	641
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	8	415	9	4	170
Total Analysis Volume [veh/h]	23	33	1661	35	16	682
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		70		0	
v_di, Inbound Pedestrian Volume crossing m	0		70		0	
v_co, Outbound Pedestrian Volume crossing	65		64		70	
v_ci, Inbound Pedestrian Volume crossing mi	64		65		70	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		6		3	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	7	7	72	72	72	72
g / C, Green / Cycle	0.08	0.08	0.80	0.80	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.47	0.02	0.06	0.19
s, saturation flow rate [veh/h]	1157	1589	3560	1428	289	3560
c, Capacity [veh/h]	88	121	2854	1145	252	2854
d1, Uniform Delay [s]	39.16	39.20	3.32	1.81	7.89	2.19
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.54	1.20	0.87	0.05	0.49	0.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.26	0.27	0.58	0.03	0.06	0.24
d, Delay for Lane Group [s/veh]	40.70	40.39	4.20	1.86	8.38	2.39
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.51	0.72	3.56	0.09	0.16	0.95
50th-Percentile Queue Length [ft/ln]	12.81	18.04	89.08	2.24	3.93	23.75
95th-Percentile Queue Length [veh/ln]	0.92	1.30	6.41	0.16	0.28	1.71
95th-Percentile Queue Length [ft/ln]	23.05	32.47	160.34	4.04	7.07	42.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.70	40.39	4.20	1.86	8.38	2.39
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	40.52		4.15		2.53	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	4.52					
Intersection LOS	A					
Intersection V/C	0.535					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	81.06	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.997	2.768	0.000
Crosswalk LOS	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.43	13.41
I_b,int, Bicycle LOS Score for Intersection	1.560	2.959	2.135
Bicycle LOS	A	C	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	6.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.555

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	32	46	1558	41	22	613
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	46	1558	41	22	613
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	12	410	11	6	161
Total Analysis Volume [veh/h]	34	48	1640	43	23	645
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6		14		7	
v_di, Inbound Pedestrian Volume crossing m	7		14		6	
v_co, Outbound Pedestrian Volume crossing	42		41		14	
v_ci, Inbound Pedestrian Volume crossing mi	41		42		14	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		7		5	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	11	68	68	68	68
g / C, Green / Cycle	0.12	0.76	0.76	0.76	0.76
(v / s)_i Volume / Saturation Flow Rate	0.05	0.45	0.46	0.08	0.18
s, saturation flow rate [veh/h]	1664	1870	1844	293	3560
c, Capacity [veh/h]	206	1422	1403	235	2708
d1, Uniform Delay [s]	36.33	4.69	4.74	10.90	3.15
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.53	1.82	1.90	0.83	0.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.59	0.60	0.10	0.24
d, Delay for Lane Group [s/veh]	38.86	6.50	6.64	11.73	3.35
Lane Group LOS	D	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.79	5.44	5.52	0.28	1.29
50th-Percentile Queue Length [ft/ln]	44.64	136.07	138.05	6.92	32.36
95th-Percentile Queue Length [veh/ln]	3.21	9.27	9.38	0.50	2.33
95th-Percentile Queue Length [ft/ln]	80.36	231.72	234.40	12.45	58.25

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.86	38.86	6.57	6.64	11.73	3.35
Movement LOS	D	D	A	A	B	A
d_A, Approach Delay [s/veh]	38.86		6.57		3.64	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	6.86					
Intersection LOS	A					
Intersection V/C	0.555					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	1.819	2.706	2.835
Crosswalk LOS	A	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.17	11.18	11.17
I_b,int, Bicycle LOS Score for Intersection	1.695	2.948	2.111
Bicycle LOS	A	C	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	29	212	82	51	151	56	140	1400	51	43	556	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	77
Total Hourly Volume [veh/h]	29	212	82	51	151	56	140	1400	51	43	556	5
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	56	22	13	40	15	37	368	13	11	146	1
Total Analysis Volume [veh/h]	31	223	86	54	159	59	147	1474	54	45	585	5
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			36			36			20		
v_di, Inbound Pedestrian Volume crossing m	20			36			36			20		
v_co, Outbound Pedestrian Volume crossing	20			31			19			31		
v_ci, Inbound Pedestrian Volume crossing mi	19			31			20			31		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	5			3			5			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	23	23	57	57	57	57	57	57
g / C, Green / Cycle	0.25	0.25	0.63	0.63	0.63	0.63	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.20	0.18	0.18	0.41	0.41	0.13	0.16	0.00
s, saturation flow rate [veh/h]	1718	1479	819	1870	1838	341	3560	1478
c, Capacity [veh/h]	474	419	518	1183	1163	198	2252	935
d1, Uniform Delay [s]	31.34	30.38	11.83	10.29	10.37	22.08	7.27	6.09
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.04	1.70	1.37	2.75	2.89	2.64	0.28	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.65	0.28	0.65	0.66	0.23	0.26	0.01
d, Delay for Lane Group [s/veh]	33.38	32.09	13.20	13.04	13.25	24.72	7.55	6.10
Lane Group LOS	C	C	B	B	B	C	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	6.95	5.43	1.76	9.10	9.14	0.84	2.30	0.03
50th-Percentile Queue Length [ft/ln]	173.83	135.77	44.08	227.55	228.61	21.07	57.44	0.86
95th-Percentile Queue Length [veh/ln]	11.28	9.25	3.17	14.05	14.10	1.52	4.14	0.06
95th-Percentile Queue Length [ft/ln]	281.94	231.31	79.35	351.24	352.59	37.92	103.39	1.55

Movement, Approach, & Intersection Results

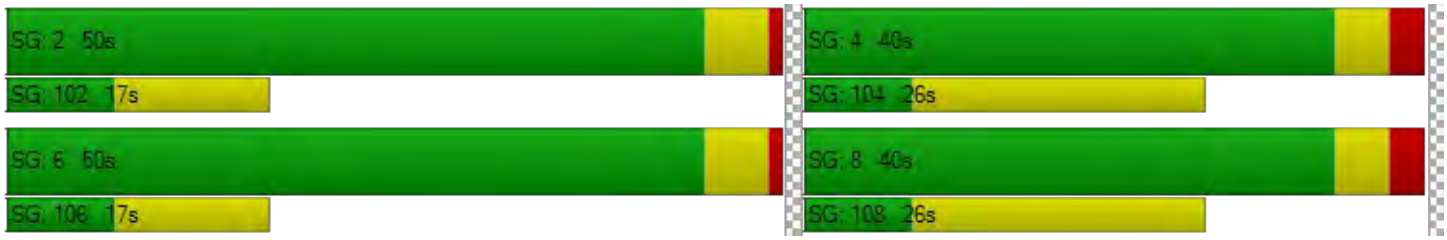
d_M, Delay for Movement [s/veh]	33.38	33.38	33.38	32.09	32.09	32.09	13.20	13.14	13.25	24.72	7.55	6.10
Movement LOS	C	C	C	C	C	C	B	B	B	C	A	A
d_A, Approach Delay [s/veh]	33.38			32.09			13.15			8.75		
Approach LOS	C			C			B			A		
d_I, Intersection Delay [s/veh]	16.31											
Intersection LOS	B											
Intersection V/C	0.672											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	34.65	34.65	34.65
I_p,int, Pedestrian LOS Score for Intersection	2.070	2.276	2.802	3.017
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	765	1003	1003
d_b, Bicycle Delay [s]	17.20	17.18	11.21	11.21
I_b,int, Bicycle LOS Score for Intersection	2.121	2.008	2.941	2.147
Bicycle LOS	B	B	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Scenario 4 Existing Weekend Midday
Report File: H:\...\Existing_Saturday.pdf
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	NB Right	0.634	7.9	A
2	Curson Ave/6th St	Signalized	HCM 6th Edition	SB Left	0.361	10.1	B
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.302	3.4	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.354	8.0	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	SB Thru	0.529	18.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	7.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	70	0	75	15	0	36	25	812	119	80	967	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	0	75	15	0	36	25	812	119	80	967	5
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	0	20	4	0	9	7	211	31	21	252	1
Total Analysis Volume [veh/h]	73	0	78	16	0	38	26	846	124	83	1007	5
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			1			2			8		
v_di, Inbound Pedestrian Volume crossing m	8			2			1			8		
v_co, Outbound Pedestrian Volume crossing	20			16			19			15		
v_ci, Inbound Pedestrian Volume crossing mi	19			15			20			16		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	2.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	9	9	42	42	42	42	42	42
g / C, Green / Cycle	0.15	0.15	0.69	0.69	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.10	0.03	0.05	0.45	0.08	0.14	0.27	0.27
s, saturation flow rate [veh/h]	1557	1668	556	1870	1513	579	1870	1866
c, Capacity [veh/h]	319	324	417	1295	1047	346	1295	1292
d1, Uniform Delay [s]	23.91	22.53	6.81	5.19	3.08	13.03	3.90	3.90
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.09	0.24	0.29	2.58	0.23	1.63	0.89	0.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.47	0.17	0.06	0.65	0.12	0.24	0.39	0.39
d, Delay for Lane Group [s/veh]	25.00	22.77	7.10	7.77	3.31	14.67	4.79	4.79
Lane Group LOS	C	C	A	A	A	B	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	1.98	0.66	0.17	4.36	0.37	0.86	1.86	1.86
50th-Percentile Queue Length [ft/ln]	49.39	16.38	4.13	108.89	9.14	21.51	46.53	46.48
95th-Percentile Queue Length [veh/ln]	3.56	1.18	0.30	7.78	0.66	1.55	3.35	3.35
95th-Percentile Queue Length [ft/ln]	88.91	29.48	7.44	194.46	16.45	38.71	83.76	83.67

Movement, Approach, & Intersection Results

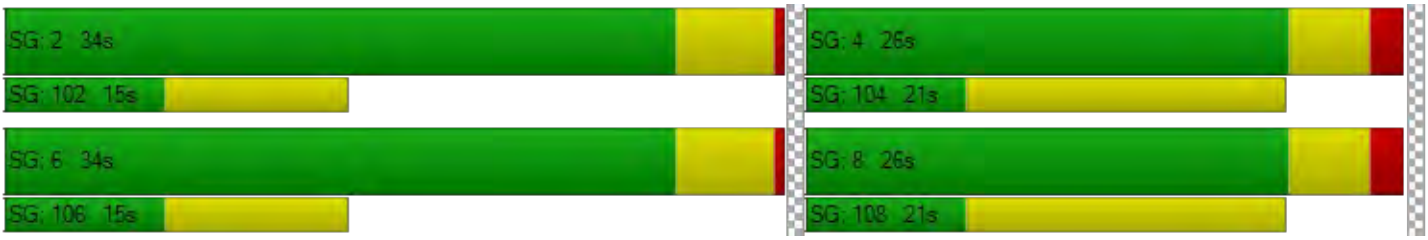
d_M, Delay for Movement [s/veh]	25.00	25.00	25.00	22.77	22.77	22.77	7.10	7.77	3.31	14.67	4.79	4.79
Movement LOS	C	C	C	C	C	C	A	A	A	B	A	A
d_A, Approach Delay [s/veh]	25.00			22.77			7.19			5.54		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	7.94											
Intersection LOS	A											
Intersection V/C	0.634											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersection	1.985	1.771	2.793	2.627
Crosswalk LOS	A	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	703	703	977	977
d_b, Bicycle Delay [s]	12.61	12.62	7.86	7.87
I_b,int, Bicycle LOS Score for Intersection	1.809	1.649	3.203	2.463
Bicycle LOS	A	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.361

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	81	44	90	48	54	32	39	415	80	83	504	55
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	44	90	48	54	32	39	415	80	83	504	55
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	11	23	12	14	8	10	106	20	21	129	14
Total Analysis Volume [veh/h]	83	45	92	49	55	33	40	423	82	85	514	56
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			14			15			13		
v_di, Inbound Pedestrian Volume crossing m	13			15			14			12		
v_co, Outbound Pedestrian Volume crossing	29			17			28			17		
v_ci, Inbound Pedestrian Volume crossing mi	28			17			29			17		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			1			1			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	13	13	13	13	37	37	37	37	37	37
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.07	0.09	0.04	0.05	0.05	0.23	0.06	0.10	0.15	0.16
s, saturation flow rate [veh/h]	1271	1573	1208	1715	834	1870	1484	882	1870	1785
c, Capacity [veh/h]	293	340	245	370	545	1142	907	534	1142	1090
d1, Uniform Delay [s]	23.95	20.21	25.14	19.45	7.57	5.87	4.79	9.35	5.38	5.39
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.52	0.77	0.40	0.33	0.26	0.92	0.20	0.64	0.53	0.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.40	0.20	0.24	0.07	0.37	0.09	0.16	0.25	0.26
d, Delay for Lane Group [s/veh]	24.48	20.98	25.54	19.77	7.83	6.80	4.99	9.98	5.91	5.96
Lane Group LOS	C	C	C	B	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	1.06	1.60	0.64	0.98	0.26	2.27	0.36	0.66	1.41	1.38
50th-Percentile Queue Length [ft/ln]	26.60	40.00	16.06	24.44	6.55	56.69	9.05	16.40	35.16	34.39
95th-Percentile Queue Length [veh/ln]	1.92	2.88	1.16	1.76	0.47	4.08	0.65	1.18	2.53	2.48
95th-Percentile Queue Length [ft/ln]	47.89	71.99	28.91	43.99	11.79	102.05	16.29	29.52	63.28	61.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.48	20.98	20.98	25.54	19.77	19.77	7.83	6.80	4.99	9.98	5.93	5.96
Movement LOS	C	C	C	C	B	B	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	22.30			21.84			6.60			6.46		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	10.10											
Intersection LOS	B											
Intersection V/C	0.361											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.182	2.065	2.625	2.472
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.66	9.08	9.09
I_b,int, Bicycle LOS Score for Intersection	1.923	1.786	2.459	2.100
Bicycle LOS	A	A	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	3.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.302

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	2	37	807	19	0	627
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	37	807	19	0	627
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	222	5	0	172
Total Analysis Volume [veh/h]	2	41	887	21	0	689
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		46		0	
v_di, Inbound Pedestrian Volume crossing m	0		45		0	
v_co, Outbound Pedestrian Volume crossing	52		51		45	
v_ci, Inbound Pedestrian Volume crossing mi	51		52		46	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		1		4	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	6	6	73	73	73	73
g / C, Green / Cycle	0.07	0.07	0.81	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.00	0.03	0.25	0.01	0.00	0.19
s, saturation flow rate [veh/h]	1208	1589	3560	1458	614	3560
c, Capacity [veh/h]	81	106	2887	1182	521	2887
d1, Uniform Delay [s]	39.24	40.21	2.14	1.63	0.00	1.99
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	2.28	0.28	0.03	0.00	0.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.39	0.31	0.02	0.00	0.24
d, Delay for Lane Group [s/veh]	39.36	42.49	2.42	1.66	0.00	2.19
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.04	0.93	1.19	0.05	0.00	0.86
50th-Percentile Queue Length [ft/ln]	1.09	23.20	29.79	1.20	0.00	21.50
95th-Percentile Queue Length [veh/ln]	0.08	1.67	2.14	0.09	0.00	1.55
95th-Percentile Queue Length [ft/ln]	1.97	41.76	53.62	2.16	0.00	38.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.36	42.49	2.42	1.66	0.00	2.19
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	42.34		2.40		2.19	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	3.36					
Intersection LOS	A					
Intersection V/C	0.302					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	125.68	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.960	2.611	0.000
Crosswalk LOS	A	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.39	13.41
I_b,int, Bicycle LOS Score for Intersection	1.560	2.309	2.128
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	8.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.354

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	41	58	751	86	44	575
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	58	751	86	44	575
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	16	204	23	12	156
Total Analysis Volume [veh/h]	45	63	816	93	48	625
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	23		22		24	
v_di, Inbound Pedestrian Volume crossing m	24		22		23	
v_co, Outbound Pedestrian Volume crossing	48		48		22	
v_ci, Inbound Pedestrian Volume crossing mi	48		48		22	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		1		5	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	18	62	62	62	62
g / C, Green / Cycle	0.20	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.06	0.24	0.26	0.08	0.18
s, saturation flow rate [veh/h]	1664	1870	1765	612	3560
c, Capacity [veh/h]	328	1285	1213	416	2446
d1, Uniform Delay [s]	30.98	5.82	5.93	9.97	5.34
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.18	0.76	0.89	0.56	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.35	0.37	0.12	0.26
d, Delay for Lane Group [s/veh]	32.16	6.58	6.82	10.54	5.59
Lane Group LOS	C	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.09	3.23	3.31	0.50	1.95
50th-Percentile Queue Length [ft/ln]	52.32	80.74	82.83	12.57	48.80
95th-Percentile Queue Length [veh/ln]	3.77	5.81	5.96	0.90	3.51
95th-Percentile Queue Length [ft/ln]	94.17	145.32	149.09	22.62	87.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.16	32.16	6.69	6.82	10.54	5.59
Movement LOS	C	C	A	A	B	A
d_A, Approach Delay [s/veh]	32.16		6.70		5.95	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	8.03					
Intersection LOS	A					
Intersection V/C	0.354					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	34.65	34.65
I_p,int, Pedestrian LOS Score for Intersection	1.904	2.515	2.705
Crosswalk LOS	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.18	11.14	11.16
I_b,int, Bicycle LOS Score for Intersection	1.738	2.310	2.115
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	18.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.529

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	39	251	68	64	178	119	103	680	24	31	448	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	8
Total Hourly Volume [veh/h]	39	251	68	64	178	119	103	680	24	31	448	56
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	67	18	17	48	32	28	183	6	8	120	15
Total Analysis Volume [veh/h]	42	270	73	69	191	128	111	731	26	33	482	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			53			53			21		
v_di, Inbound Pedestrian Volume crossing m	21			53			53			20		
v_co, Outbound Pedestrian Volume crossing	36			51			36			50		
v_ci, Inbound Pedestrian Volume crossing mi	36			50			36			51		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			3			3			6		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	27	27	52	52	52	52	52	52
g / C, Green / Cycle	0.30	0.30	0.58	0.58	0.58	0.58	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.24	0.28	0.13	0.20	0.21	0.05	0.14	0.04
s, saturation flow rate [veh/h]	1588	1401	846	1870	1834	703	3560	1417
c, Capacity [veh/h]	522	468	501	1090	1069	401	2075	826
d1, Uniform Delay [s]	28.43	30.03	13.06	9.83	9.85	13.97	9.05	8.14
k, delay calibration	0.17	0.23	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.15	7.77	1.02	0.88	0.91	0.40	0.26	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.83	0.22	0.35	0.35	0.08	0.23	0.07
d, Delay for Lane Group [s/veh]	31.58	37.80	14.08	10.71	10.76	14.38	9.32	8.31
Lane Group LOS	C	D	B	B	B	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	7.77	8.86	1.38	3.88	3.85	0.42	2.18	0.51
50th-Percentile Queue Length [ft/ln]	194.23	221.50	34.50	97.09	96.26	10.41	54.59	12.77
95th-Percentile Queue Length [veh/ln]	12.34	13.74	2.48	6.99	6.93	0.75	3.93	0.92
95th-Percentile Queue Length [ft/ln]	308.51	343.54	62.10	174.76	173.26	18.74	98.26	22.98

Movement, Approach, & Intersection Results

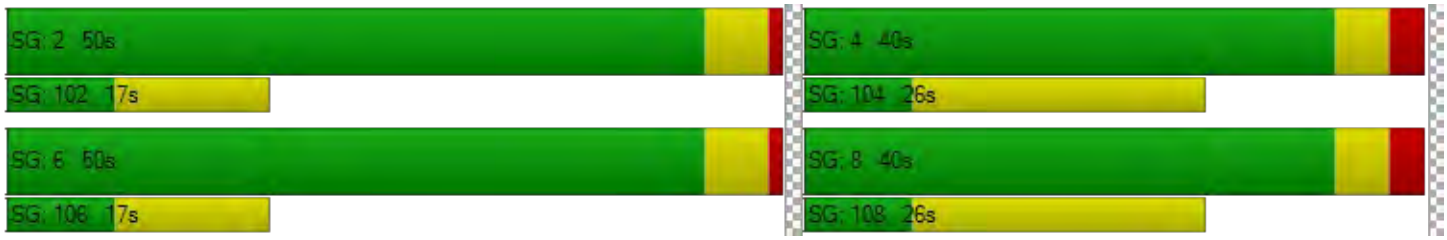
d_M, Delay for Movement [s/veh]	31.58	31.58	31.58	37.80	37.80	37.80	14.08	10.74	10.76	14.38	9.32	8.31
Movement LOS	C	C	C	D	D	D	B	B	B	B	A	A
d_A, Approach Delay [s/veh]	31.58			37.80			11.16			9.50		
Approach LOS	C			D			B			A		
d_I, Intersection Delay [s/veh]	18.94											
Intersection LOS	B											
Intersection V/C	0.529											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	2.071	2.280	2.655	2.798
Crosswalk LOS	B	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	765	1002	1002
d_b, Bicycle Delay [s]	17.19	17.19	11.21	11.23
I_b,int, Bicycle LOS Score for Intersection	2.195	2.200	2.276	2.041
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix 5 — Plans, Policies and Programs Consistency Worksheet

LADOT

Plans, Policies and Programs Consistency Worksheet

The worksheet provides a structured approach to evaluate the threshold T-1 question below, that asks whether a project conflicts with a program, plan, ordinance or policy addressing the circulation system. The intention of the worksheet is to streamline the project review by highlighting the most relevant plans, policies and programs when assessing potential impacts to the City's circulation system.

> ***Threshold T-1***: Would the project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities?

This worksheet does not include an exhaustive list of City policies, and does not include community plans, specific plans, or any area-specific regulatory overlays. The Department of City Planning project planner will need to be consulted to determine if the project would obstruct the City from carrying out a policy or program in a community plan, specific plan, streetscape plan, or regulatory overlay that was adopted to support multimodal transportation options or public safety. LADOT staff should be consulted if a project would lead to a conflict with a mobility investment in the Public Right of Way (PROW) that is currently undergoing planning, design, or delivery. This worksheet must be completed for all projects that meet the Section I. Screening Criteria. For description of the relevant planning documents, **see Attachment D.1.**

For any response to the following questions that checks the box in **bold text** ((i.e. ☐ **Yes** or ☐ **No**), further analysis is needed to demonstrate that the project does not conflict with a plan, policy, or program.

I. SCREENING CRITERIA FOR POLICY ANALYSIS

If the answer is 'yes' to any of the following questions, further analysis will be required:

Does the project require a discretionary action that requires the decision maker to find that the project would substantially conform to the purpose, intent and provisions of the General Plan?

☒ Yes ☐ No

Is the project known to directly conflict with a transportation plan, policy, or program adopted to support multimodal transportation options or public safety?

☐ Yes ☒ No

Is the project required to or proposing to make any voluntary modifications to the public right-of-way (i.e., dedications and/or improvements in the right-of-way, reconfigurations of curb line, etc.)?

☒ Yes ☐ No

II. PLAN CONSISTENCY ANALYSIS

A. Mobility Plan 2035 PROW Classification Standards for Dedications and Improvements

These questions address potential conflict with:

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Mobility Plan 2035 Policy 2.1 *– Adaptive Reuse of Streets. Design, plan, and operate streets to serve multiple purposes and provide flexibility in design to adapt to future demands.*

Mobility Plan 2035 Policy 2.3 *– Pedestrian Infrastructure. Recognize walking as a component of every trip, and ensure high quality pedestrian access in all site planning and public right-of-way modifications to provide a safe and comfortable walking environment.*

Mobility Plan 2035 Policy 3.2 – *People with Disabilities. Accommodate the needs of people with disabilities when modifying or installing infrastructure in the public right-of-way.*

Mobility Plan 2035 Street Designations and Standard Roadway Dimensions

A.1 Does the project include additions or new construction along a street designated as a Boulevard I, and II, and/or Avenue I, II, or III on property zoned for R3 or less restrictive zone? ☐ Yes ☒ No

Wilshire Boulevard is an Avenue I and 6th Street is an Avenue II, but the property is not zoned for R3 or a less restrictive zone.

A.2 If **A.1 is yes**, is the project required to make additional dedications or improvements to the Public Right of Way as demonstrated by the street designation. ☐ Yes ☐ No ☒ N/A

A.3 If **A.2 is yes**, is the project making the dedications and improvements as necessary to meet the designated dimensions of the fronting street (Boulevard I, and II, or Avenue I, II, or III)?

☐ Yes ☐ No ☒ N/A

If the answer is to **A.1 or A.2 is NO, or to A.1, A.2 and A.3. is YES**, then the project does not conflict with the dedication and improvement requirements that are needed to comply with the Mobility Plan 2035 Street Designations and Standard Roadway Dimensions.

The answer to A.1 is NO. Therefore, the project does not conflict with the dedication and improvement requirements that are needed to comply with the Mobility Plan 2035 Street Designations and Standard Roadway Dimensions.

A.4 If the answer to **A.3. is NO**, is the project applicant asking to waive from the dedication standards?

☐ **Yes** ☐ **No** ☒ N/A

Lists any streets subject to dedications or voluntary dedications and include existing roadway and sidewalk widths, required roadway and sidewalk widths, and proposed roadway and sidewalk width or waivers.

Frontage 1 Existing PROW'/Curb' : Existing
_____Required_____Proposed_____

Frontage 2 Existing PROW'/Curb' : Existing
_____Required_____Proposed_____

Frontage 3 Existing PROW'/Curb' : Existing
_____Required_____Proposed_____

Frontage 4 Existing PROW'/Curb' : Existing
_____Required_____Proposed_____

If the answer to **A.4 is NO**, the project is inconsistent with Mobility Plan 2035 street designations and must file for a waiver of street dedication and improvement.

If the answer to **A.4 is YES**, additional analysis is necessary to determine if the dedication and/or improvements are necessary to meet the City's mobility needs for the next 20 years. The following factors may contribute to determine if the dedication or improvement is necessary:

Is the project site along any of the following networks identified in the City's Mobility Plan?

- Transit Enhanced Network
- Bicycle Enhanced Network
- Bicycle Lane Network
- Pedestrian Enhanced District
- Neighborhood Enhanced Network

To see the location of the above networks, see **Transportation Assessment Support Map**.[1]

Is the project within the service area of Metro Bike Share, or is there demonstrated demand for micro-mobility services?

If the project dedications and improvements asking to be waived are necessary to meet the City's mobility needs, the project may be found to conflict with a plan that is adopted to protect the environment.

B. Mobility Plan 2035 PROW Policy Alignment with Project-Initiated Changes

B.1 Project-Initiated Changes to the PROW Dimensions

These questions address potential conflict with:

Mobility Plan 2035 Policy 2.1 *– Adaptive Reuse of Streets. Design, plan, and operate streets to serve multiple purposes and provide flexibility in design to adapt to future demands.*

Mobility Plan 2035 Policy 2.3 *– Pedestrian Infrastructure. Recognize walking as a component of every trip, and ensure high quality pedestrian access in all site planning and public right-of-way modifications to provide a safe and comfortable walking environment.*

Mobility Plan 2035 Policy 3.2 – *People with Disabilities. Accommodate the needs of people with disabilities when modifying or installing infrastructure in the public right-of-way.*

Mobility Plan 2035 Policy 2.10 *– Loading Areas. Facilitate the provision of adequate on and off-site street loading areas.*

Mobility Plan 2035 Street Designations and Standard Roadway Dimensions

B.1 Does the project physically modify the curb placement or turning radius and/or physically alter the sidewalk and parkways space that changes how people access a property?

Examples of physical changes to the public right-of-way include:

[1] LADOT Transportation Assessment Support Map https://arcg.is/fubbD

- widening the roadway,
- narrowing the sidewalk,
- adding space for vehicle turn outs or loading areas,
- removing bicycle lanes, bike share stations, or bicycle parking
- modifying existing bus stop, transit shelter, or other street furniture
- paving, narrowing, shifting or removing an existing parkway or tree well

The proposed project includes modifying curb placement for the curbside loading on the west side of Curson Avenue. ☒ **Yes** ☐ No

B.2 Driveway Access

These questions address potential conflict with:

Mobility Plan 2035 Policy 2.10 *– Loading Areas. Facilitate the provision of adequate on and off-site street loading areas.*

Mobility Plan 2035 Program PL.1. Driveway Access. *Require driveway access to buildings from non-arterial streets or alleys (where feasible) in order to minimize interference with pedestrian access and vehicular movement.*

Citywide Design Guidelines - Guideline 2*: Carefully incorporate vehicular access such that it does not degrade the pedestrian experience.*

Site Planning Best Practices:

- *Prioritize pedestrian access first and automobile access second. Orient parking and driveways toward the rear or side of buildings and away from the public right-of-way. On corner lots, parking should be oriented as far from the corner as possible.*
- *Minimize both the number of driveway entrances and overall driveway widths.*
- *Do not locate drop-off/pick-up areas between principal building entrances and the adjoining sidewalks.*
- *Orient vehicular access as far from street intersections as possible.*
- *Place drive-thru elements away from intersections and avoid placing them so that they create a barrier between the sidewalk and building entrance(s).*
- *Ensure that loading areas do not interfere with on-site pedestrian and vehicular circulation by separating loading areas and larger commercial vehicles from areas that are used for public parking and public entrances.*

B.2 Does the project add new driveways along a street designated as an Avenue or a Boulevard that conflict with LADOT's Driveway Design Guidelines (See Sec. 321 in the Manual of Policies and Procedures) by any of the following:

- locating new driveways for residential properties on an Avenue or Boulevard, and access is otherwise possible using an alley or a collector/local street, or
- locating new driveways for industrial or commercial properties on an Avenue or Boulevard and access is possible along a collector/local street, or
- the total number of new driveways exceeds 1 driveway per every 200 feet[2] along on the Avenue or Boulevard frontage, or

[2] for a project frontage that exceeds 400 feet along an Avenue or Boulevard, the incremental additional driveway above 2 is more than 1 driveway for every 400 additional feet.

- locating new driveways on an Avenue or Boulevard within 150 feet from the intersecting street, or
- locating new driveways on a collector or local street within 75 feet from the intersecting street, or
- locating new driveways near mid-block crosswalks, requiring relocation of the mid-block crosswalk

The proposed project includes a new driveway on 6th Street (an Avenue II). However, this does not result in exceeding 1 driveway per every 200 feet along the Avenue II frontage, locating it within 150 feet of the intersecting street, or locating it near a mid-block crosswalk.

☐ **Yes** ☒ No

If the answer to **B.1 and B.2 are both NO**, then the project would not conflict with a plan or policies that govern the PROW as a result of the project-initiated changes to the PROW.

The answer to B.1 is YES.

Impact Analysis

If the answer to either **B.1 or B.2 are YES**, City plans and policies should be reviewed in light of the proposed physical changes to determine if the City would be obstructed from carrying out the plans and policies. The analysis should pay special consideration to substantial changes to the Public Right of Way that may either degrade existing facilities for people walking and bicycling (e.g., removing a bicycle lane), or preclude the City from completing complete street infrastructure as identified in the Mobility Plan 2035, especially if the physical changes are along streets that are on the High Injury Network (HIN). The analysis should also consider if the project is in a Transit Oriented Community (TOC) area, and would degrade or inhibit trips made by biking, walking and/ or transit ridership. The streets that need special consideration are those that are included on the following networks identified in the Mobility Plan 2035, or the HIN:

- Transit Enhanced Network
- Bicycle Enhanced Network
- Bicycle Lane Network
- Pedestrian Enhanced District
- Neighborhood Enhanced Network
- High Injury Network

Curson Avenue along the project frontage is not on the HIN. It is not a part of one of the designated multimodal networks.
There are no existing or planned transit lines, transit stops, or bikeways. The existing sidewalk would be maintained. The project proposes to modify the curb line to create a bay for a section of curb that is already designated as a bus zone. This moves loading/unloading out of the travel lanes and reduces conflicts such as pedestrians vs. vehicles and bicycles vs. buses.

To see the location of the above networks, see **Transportation Assessment Support Map**.[3]

Once the project is reviewed relevant to plans and policies, and existing facilities that may be impacted by the project, the analysis will need to answer the following two questions in concluding if there is an impact due to plan inconsistency.

B.2.1 Would the physical changes in the public right of way or new driveways that conflict with LADOT's Driveway Design Guidelines degrade the experience of vulnerable roadway users such as modify, remove, or otherwise negatively impact existing bicycle, transit, and/or pedestrian infrastructure?

☐ **Yes** ☒ No ☐ N/A

B.2.2 Would the physical modifications or new driveways that conflict with LADOT's Driveway Design Guidelines preclude the City from advancing the safety of vulnerable roadway users?

☐ **Yes** ☒ No ☐ N/A

[3] LADOT Transportation Assessment Support Map https://arcg.is/fubbD

If either of the answers to either **B.2.1 or B.2.2 are YES**, the project may conflict with the Mobility Plan 2035, and therefore conflict with a plan that is adopted to protect the environment. If either of the answers to both **B.2.1. or B.2.2. are NO**, then the project would not be shown to conflict with plans or policies that govern the Public Right-of-Way.

The answers to B.2.1 and B.2.2 are NO. Therefore, the project would not conflict with plans or policies that govern the Public Right-of-Way.

C. Network Access

C. 1 Alley, Street and Stairway Access

These questions address potential conflict with:

Mobility Plan Policy 3.9 *Increased Network Access: Discourage the vacation of public rights-of-way.*

C.1.1 Does the project propose to vacate or otherwise restrict public access to a street, alley, or public stairway?

☐ Yes ☒ No

C.1.2 If the answer to C.1.1 is Yes, will the project provide or maintain public access to people walking and biking on the street, alley or stairway?

☐ Yes ☐ **No** ☒ N/A

C.2 New Cul-de-sacs

These questions address potential conflict with:

Mobility Plan 2035 Policy 3.10 *Cul-de-sacs: Discourage the use of cul-de-sacs that do not provide access for active transportation options.*

C.2.1 Does the project create a cul-de-sac or is the project located adjacent to an existing cul-de-sac?

☐ Yes ☒ No

C.2.2 If yes, will the cul-de-sac maintain convenient and direct public access to people walking and biking to the adjoining street network?

☐ Yes ☐ **No** ☒ N/A

If the answers to either C.1.2 or C.2.2 are YES, then the project would not conflict with a plan or policies that ensures access for all modes of travel. If the answer to either **C.1.2 or C.2.2 are NO**, the project may conflict with a plan or policies that governs multimodal access to a property. Further analysis must assess to the degree that pedestrians and bicyclists have sufficient public access to the transportation network. The answers to C.1.2 and C.2.2 are N/A. The project would not conflict with a plan or policies that ensures access for all modes of travel.

D. Parking Supply and Transportation Demand Management

These questions address potential conflict with:

Mobility Plan 2035 Policy 3.8 *– Bicycle Parking, Provide bicyclists with convenient, secure and well maintained bicycle parking facilities.*

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Mobility Plan 2035 Policy 4.8 *– Transportation Demand Management Strategies. Encourage greater utilization of Transportation Demand Management Strategies to reduce dependence on single-occupancy vehicles.*

Mobility Plan 2035 Policy 4.13 *– Parking and Land Use Management: Balance on-street and off-street parking supply with other transportation and land use objectives.*

D.1 Would the project propose a supply of onsite parking that exceeds the baseline amount[4] as required in the Los Angeles Municipal Code or a Specific plan, whichever requirement prevails?

No increase in the on-site parking supply is anticipated.

□ Yes ☒ No

D.2 If the answer to D.1. is YES, would the project propose to actively manage the demand of parking by independently pricing the supply to all users (e.g. parking cash-out), or for residential properties, unbundle the supply from the lease or sale of residential units?

□ Yes □ **No** ☒ N/A

If the answer to **D.2. is NO** the project may conflict with parking management policies. Further analysis is needed to demonstrate how the supply of parking above city requirements will not result in additional (induced) drive-alone trips as compared to an alternative that provided no more parking than the baseline required by the LAMC or Specific Plan. If there is potential for the supply of parking to result in induced demand for drive-alone trips, the project should further explore transportation demand management (TDM) measures to further off-set the induced demands of driving and vehicle miles travelled (VMT) that may result from higher amounts of on-site parking. The TDM measures should specifically focus on strategies that encourage dynamic and context-sensitive pricing solutions and ensure the parking is efficiently allocated, such as providing real time information. Research has demonstrated that charging a user cost for parking or providing a 'cash-out' option in return for not using it is the most effective strategy to reduce the instances of drive-alone trips and increase non-auto mode share to further reduce VMT. To ensure the parking is efficiently managed and reduce the need to build parking for future uses, further strategies should include sharing parking with other properties and/or the general public. The answer to D.2 is N/A -- would not conflict with parking management policies.

D.3. Would the project provide the minimum on and off-site bicycle parking spaces as required by Section 12.21 A.16 of the LAMC?

The site plan is conceptual and does not indicate if requirements will be met. Short-term parking requirement: 1 per 10KSF (min. 2) = 4 spaces.Long-term parking requirement: 1 per 5KSF (min. 2) = 8 spaces.

□ Yes ☒ **No**

D.4. Does the Project include more than 25,000 square feet of gross floor area construction of new non-residential gross floor?

42,000 square feet of new non-residential floor area

☒Yes □ No

D.5 If the answer to D.4. is YES, does the project comply with the City's TDM Ordinance in Section 12.26 J of the LAMC?

The site plan is conceptual and does not indicate if requirements will be met: Transportation information display with public transit information, contact info for rideshare and transit, ridesharing promotional material, bike route and facility information, and listing of on-site services or facilities.

□ Yes ☒ **No** □ N/A

[4] The baseline parking is defined here as the default parking requirements in section 12.21 A.4 of the Los Angeles Municipal Code or any applicable Specific Plan, whichever prevails, for each applicable use not taking into consideration other parking incentives to reduce the amount of required parking.

If the answer to **D.3. or D.5. is NO** the project conflicts with LAMC code requirements of bicycle parking and TDM measures. If the project includes uses that require bicycle parking (Section 12.21 A.16) or TDM (Section 12.26 J), and the project does not comply with those Sections of the LAMC, further analysis is required to ensure that the project supports the intent of the two LAMC sections. To meet the intent of bicycle parking requirements, the analysis should identify how the project commits to providing safe access to those traveling by bicycle and accommodates storing their bicycle in locations that demonstrates priority over vehicle access.

Similarly, to meet the intent of the TDM requirements of Section 12.26 J of the LAMC, the analysis should identify how the project commits to providing effective strategies in either physical facilities or programs that encourage non-drive alone trips to and from the project site and changes in work schedule that move trips out of the peak period or eliminate them altogether (as in the case in telecommuting or compressed work weeks).

The answers to D.3 and D.5 are NO. The project may conflict with LAMC code requirements for bicycle parking and TDM measures. Mitigation measures may be required to ensure the project is consistent with requirements

E. Consistency with Regional Plans

This section addresses potential inconsistencies with greenhouse gas (GHG) reduction targets forecasted in the Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS).

E.1 Does the Project or Plan apply one the City's efficiency-based impact thresholds (i.e. VMT per capita, VMT per employee, or VMT per service population) as discussed in **Section 2.2.3** of the TAG?

This project applies the total VMT threshold.

☐ Yes ☒ No

E.2 If the Answer to **E.1 is YES**, does the Project or Plan result in a significant VMT impact?

☐ **Yes** ☐ No ☒ N/A

E.3 If the Answer to **E.1 is NO**, does the Project result in a net increase in VMT?

☒ **Yes** ☐ No ☐ N/A

If the Answer to **E.2 or E.3 is NO**, then the Project or Plan is shown to align with the long-term VMT and GHG reduction goals of SCAG's RTP/SCS.

E.4 If the Answer to **E.2 or E.3 is YES**, then further evaluation would be necessary to determine whether such a project or land use plan would be shown to be consistent with VMT and GHG reduction goals of the SCAG RTP/SCS. For the purpose of making a finding that a project is consistent with the GHG reduction targets forecasted in the SCAG RTP/SCS, the project analyst should consult **Section 2.2.4** of the Transportation Assessment Guidelines (TAG). **Section 2.2.4** provides the methodology for evaluating a land use project's cumulative impacts to VMT, and the appropriate reliance on SCAG's most recently adopted RTP/SCS in reaching that conclusion. The answer to E.3 is YES. More evaluation is required.

The analysis methods therein can further support findings that the project is consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy for which the State Air Resources Board, pursuant to Section 65080(b)(2)(H) of the Government Code, has accepted a metropolitan planning organization's determination that the sustainable communities strategy or the alternative planning strategy would, if implemented, achieve the greenhouse gas emission reduction targets.

Without mitigation measures, the project may be inconsistent with SCAG's goals related to improving mobility and accessibility, ensuring safety, maximizing transportation productivity, encouraging active transportation, and improving air quality. The proposed project does not include transportation improvements to encourage and improve active transportation and public transit outside of on-site access and circulation improvements.

Appendix 6 — Visitor Zip Code and VMT Data

Zip Code	Quantity	One-Way Distance	Total One-Way VMT
90001	723	12.28	8,881
90002	1044	14.12	14,745
90003	885	11.60	10,269
90004	1707	3.38	5,767
90005	1375	3.03	4,162
90006	1058	4.54	4,808
90007	2543	6.66	16,930
90008	472	5.28	2,494
90009	21	8.70	183
90010	152	2.70	410
90011	1507	9.36	14,108
90012	508	7.72	3,921
90013	187	7.81	1,460
90014	137	6.92	948
90015	424	6.81	2,885
90016	789	3.23	2,548
90017	524	5.59	2,928
90018	633	4.34	2,746
90019	2056	1.99	4,087
90020	962	3.10	2,984
90021	126	8.04	1,013
90022	860	14.01	12,045
90023	608	10.67	6,485
90024	1650	5.04	8,310
90025	1630	6.17	10,056
90026	1352	6.42	8,674
90027	1139	7.84	8,927
90028	725	4.09	2,969
90029	524	5.22	2,737
90030	27	9.90	267
90031	492	9.98	4,912
90032	623	12.76	7,947
90033	686	9.62	6,602
90034	1918	5.28	10,125
90035	1347	2.62	3,530
90036	5617	1.06	5,942
90037	610	8.18	4,988
90038	511	3.37	1,720
90039	651	9.14	5,950
90040	121	15.42	1,866
90041	565	13.50	7,630
90042	983	12.35	12,139
90043	779	7.77	6,049
90044	657	11.39	7,481
90045	1333	10.69	14,246
90046	1771	3.79	6,704

90047	610	10.30	6,286
90048	1678	2.00	3,351
90049	970	10.22	9,911
90050	14	15.00	210
90051	2	15.80	32
90052	12	12.90	155
90053	13	9.90	129
90054	37	9.90	366
90055	11	7.80	86
90056	141	6.28	885
90057	318	4.86	1,545
90058	86	11.16	959
90059	378	16.07	6,073
90061	517	15.05	7,783
90062	604	6.90	4,167
90063	828	11.29	9,347
90064	1364	5.87	8,012
90065	1265	11.41	14,428
90066	2219	6.95	15,422
90067	127	4.16	529
90068	662	7.41	4,903
90069	597	3.71	2,217
90071	54	6.38	344
90073	9	6.76	61
90077	302	7.73	2,334
90089	32	6.77	217
90094	391	8.25	3,227
90095	193	5.81	1,122
90201	692	19.30	13,353
90210	989	5.96	5,897
90211	562	1.85	1,042
90212	518	3.29	1,702
90220	556	20.28	11,274
90221	406	21.00	8,525
90222	242	17.77	4,301
90230	1205	6.44	7,756
90232	985	4.71	4,635
90240	395	18.44	7,286
90241	449	19.97	8,964
90242	461	21.15	9,748
90245	547	12.05	6,594
90247	496	17.39	8,625
90248	111	19.20	2,131
90249	234	14.49	3,390
90250	992	12.49	12,385
90254	491	17.03	8,363
90255	734	12.80	9,399

90260	583	13.86	8,081
90262	946	18.39	17,392
90263	24	23.62	567
90265	332	30.29	10,056
90266	1095	13.63	14,924
90270	136	13.88	1,888
90272	913	16.20	14,789
90274	485	24.82	12,039
90275	791	28.04	22,179
90277	746	21.07	15,721
90278	1202	14.73	17,703
90280	863	17.84	15,398
90290	220	21.57	4,746
90291	806	8.73	7,037
90292	470	9.22	4,334
90293	255	10.65	2,715
90301	291	8.81	2,564
90302	375	7.68	2,880
90303	471	11.73	5,526
90304	228	10.20	2,326
90305	93	10.37	964
90401	214	9.69	2,073
90402	408	10.20	4,162
90403	982	9.18	9,011
90404	646	8.34	5,387
90405	953	9.16	8,728
90501	435	21.51	9,356
90502	236	20.95	4,945
90503	747	19.28	14,403
90504	787	16.16	12,717
90505	521	21.66	11,284
90506	20	15.42	308
90601	466	23.39	10,902
90602	210	24.77	5,202
90603	242	28.32	6,853
90604	449	25.78	11,576
90605	361	28.40	10,252
90606	306	21.13	6,467
90620	379	28.72	10,886
90621	167	28.00	4,676
90623	188	28.90	5,433
90630	503	30.81	15,496
90631	493	31.87	15,711
90638	804	28.05	22,549
90640	478	16.74	8,000
90650	949	22.60	21,443
90660	657	19.97	13,123

90670	110	21.32	2,346
90680	112	32.36	3,624
90701	218	25.65	5,592
90703	691	26.05	18,003
90706	578	23.78	13,743
90710	295	23.89	7,048
90712	306	27.24	8,336
90713	317	27.45	8,701
90715	135	27.54	3,717
90716	117	28.48	3,332
90717	369	23.74	8,762
90720	261	32.34	8,440
90723	425	22.19	9,430
90731	689	28.03	19,315
90732	415	28.45	11,806
90740	247	35.02	8,651
90742	14	36.51	511
90743	11	35.63	392
90744	474	25.66	12,162
90745	503	22.67	11,403
90746	332	21.52	7,144
90755	83	27.81	2,308
90802	383	29.79	11,409
90803	545	31.39	17,108
90804	425	30.17	12,822
90805	511	23.63	12,074
90806	285	26.42	7,530
90807	349	26.85	9,370
90808	906	29.26	26,512
90810	188	24.75	4,654
90813	188	28.37	5,334
90814	168	31.30	5,259
90815	435	29.85	12,986
91001	680	20.18	13,724
91006	452	24.46	11,057
91007	360	22.78	8,199
91008	6	27.54	165
91010	443	30.55	13,533
91011	647	34.82	22,531
91016	525	28.64	15,039
91020	158	18.66	2,949
91024	275	23.31	6,410
91030	850	14.04	11,936
91040	344	16.22	5,578
91042	253	29.15	7,374
91101	400	17.00	6,800
91103	317	17.20	5,452

91104	637	19.26	12,268
91105	287	15.04	4,316
91106	404	17.75	7,170
91107	545	20.54	11,194
91108	455	17.19	7,823
91201	346	11.25	3,894
91202	323	12.09	3,904
91203	194	10.90	2,115
91204	334	9.77	3,262
91205	314	10.53	3,305
91206	443	12.78	5,660
91207	161	18.42	2,966
91208	269	16.10	4,330
91210	22	10.70	235
91214	772	20.48	15,808
91301	434	33.39	14,492
91302	584	27.58	16,104
91303	300	23.50	7,050
91304	469	26.48	12,417
91306	434	22.65	9,829
91307	427	29.21	12,474
91311	509	28.61	14,565
91316	505	15.82	7,989
91321	547	26.77	14,643
91324	324	23.04	7,464
91325	1177	20.08	23,638
91326	807	24.30	19,608
91330	223	22.14	4,936
91331	1739	16.30	28,353
91335	704	19.93	14,029
91340	529	19.16	10,137
91342	1329	31.15	41,401
91343	790	18.61	14,704
91344	816	22.02	17,966
91345	169	18.69	3,159
91350	522	31.79	16,596
91351	290	31.98	9,275
91352	334	14.40	4,810
91354	488	33.61	16,404
91355	692	36.24	25,075
91356	495	19.73	9,764
91364	445	22.10	9,836
91367	701	22.85	16,020
91381	321	30.87	9,908
91384	263	42.06	11,062
91387	704	30.55	21,508
91390	196	43.85	8,595

91401	571	11.58	6,612
91402	670	15.77	10,566
91403	564	12.06	6,803
91405	502	14.72	7,391
91406	615	17.26	10,616
91411	468	13.27	6,212
91423	959	9.57	9,174
91436	381	14.61	5,566
91501	275	12.05	3,313
91502	170	10.76	1,829
91504	507	12.73	6,453
91505	1083	9.46	10,244
91506	372	9.32	3,467
91601	497	9.16	4,553
91602	444	7.91	3,513
91604	871	7.10	6,184
91605	662	12.22	8,087
91606	540	10.66	5,755
91607	850	9.14	7,767
91608	12	6.80	82
91702	426	51.74	22,041
91706	523	25.63	13,406
91711	655	41.84	27,408
91722	485	29.01	14,072
91723	224	29.46	6,598
91724	247	31.86	7,871
91731	252	20.29	5,114
91732	421	21.46	9,033
91733	394	20.52	8,083
91740	190	34.37	6,531
91741	328	37.03	12,147
91744	449	26.93	12,094
91745	720	26.02	18,736
91746	232	23.28	5,402
91748	328	30.71	10,072
91750	413	39.72	16,404
91754	310	15.07	4,671
91755	212	17.05	3,616
91765	526	37.14	19,537
91766	488	37.35	18,228
91767	290	37.64	10,916
91768	498	34.81	17,335
91770	491	17.59	8,635
91773	392	34.32	13,453
91775	317	18.84	5,973
91776	249	17.76	4,422
91780	387	20.73	8,024

91789	704	33.62	23,666
91790	518	25.85	13,390
91791	400	28.51	11,406
91792	165	30.83	5,087
91801	612	16.18	9,902
91803	390	14.05	5,480
92602	275	48.04	13,212
92603	201	53.11	10,674
92604	278	46.41	12,901
92606	194	46.02	8,927
92610	127	55.69	7,072
92612	183	48.51	8,878
92614	199	46.31	9,215
92617	103	50.13	5,163
92618	353	48.80	17,226
92620	788	46.41	36,574
92624	44	65.42	2,879
92625	105	52.04	5,465
92626	359	45.02	16,164
92627	377	47.18	17,788
92629	261	64.66	16,877
92630	444	53.49	23,748
92637	62	53.45	3,314
92646	438	43.95	19,251
92647	449	38.85	17,443
92648	335	42.36	14,190
92649	371	38.47	14,271
92651	300	56.15	16,846
92653	225	56.10	12,623
92655	17	39.20	666
92656	423	56.68	23,974
92657	71	53.41	3,792
92660	242	49.53	11,986
92661	24	50.94	1,223
92662	22	51.00	1,122
92663	136	48.31	6,571
92672	206	74.01	15,246
92673	180	67.02	12,064
92675	258	70.69	18,239
92676	37	55.43	2,051
92677	442	61.12	27,017
92679	225	68.01	15,303
92683	806	36.84	29,690
92688	330	59.49	19,631
92691	423	55.95	23,668
92692	367	57.24	21,008
92694	365	59.77	21,816

92697	1	49.04	49
92701	395	39.82	15,731
92703	126	38.56	4,858
92704	302	42.45	12,819
92705	317	43.08	13,657
92706	121	38.22	4,625
92707	216	42.16	9,107
92708	496	42.06	20,863
92780	287	41.76	11,984
92782	340	44.01	14,963
92801	297	31.17	9,257
92802	202	34.32	6,934
92804	334	32.40	10,822
92805	400	34.20	13,682
92806	234	36.03	8,431
92807	342	40.67	13,910
92808	167	49.52	8,270
92821	379	36.96	14,007
92823	45	42.13	1,896
92831	198	34.37	6,806
92832	271	32.02	8,678
92833	463	30.69	14,207
92835	167	33.50	5,594
92840	204	36.09	7,361
92841	111	34.91	3,875
92843	194	37.48	7,270
92844	117	38.81	4,541
92845	174	32.91	5,726
92861	61	40.65	2,480
92865	160	37.57	6,010
92866	137	39.57	5,421
92867	483	38.64	18,662
92868	201	36.86	7,409
92869	248	43.70	10,837
92870	483	38.23	18,467
92886	498	42.40	21,114
92887	207	45.06	9,327
93510	96	46.30	4,445
93532	11	81.84	900
93534	516	68.47	35,332
93535	332	80.69	26,791
93536	788	78.62	61,956
93543	158	65.39	10,331
93544	10	77.02	770
93550	539	48.66	26,230
93551	847	63.73	53,980
93552	221	61.49	13,590

93553	29	69.53	2,016
93591	35	78.93	2,763
	182,259		3,590,911

19.70

Appendix 7 — Opening Year (2032) Intersection LOS and Queuing Worksheets

La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Report File: H:\...\OpeningYear_AM.pdf

Scenario 5 Opening Year Weekday AM
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	SB Right	0.719	8.3	A
2	Curson Ave/6th St	Signalized	HCM 6th Edition	NB Left	1.050	59.0	E
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.480	2.2	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.533	7.2	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	SB Left	2.002	269.4	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.719

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	3	0	7	30	0	70	7	966	33	33	2102	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	0	7	30	0	70	7	966	33	33	2102	22
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	2	8	0	18	2	249	9	9	542	6
Total Analysis Volume [veh/h]	3	0	7	31	0	72	7	996	34	34	2167	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			3			3			2		
v_di, Inbound Pedestrian Volume crossing m	2			3			3			2		
v_co, Outbound Pedestrian Volume crossing	7			6			7			6		
v_ci, Inbound Pedestrian Volume crossing mi	7			6			7			6		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			3			7		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	69.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	64	0	0	64	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	8	8	72	72	72	72	72	72
g / C, Green / Cycle	0.09	0.09	0.80	0.80	0.80	0.80	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.04	0.53	0.02	0.06	0.59	0.59
s, saturation flow rate [veh/h]	1708	1537	179	1870	1542	548	1870	1862
c, Capacity [veh/h]	211	195	167	1496	1234	377	1496	1489
d1, Uniform Delay [s]	37.19	39.51	12.46	3.84	1.84	10.04	4.33	4.36
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	2.20	0.47	2.36	0.04	0.47	3.20	3.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.53	0.04	0.67	0.03	0.09	0.73	0.74
d, Delay for Lane Group [s/veh]	37.28	41.72	12.93	6.20	1.88	10.51	7.53	7.63
Lane Group LOS	D	D	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.20	2.30	0.09	5.47	0.09	0.36	6.89	6.95
50th-Percentile Queue Length [ft/ln]	5.11	57.49	2.37	136.68	2.18	8.98	172.31	173.73
95th-Percentile Queue Length [veh/ln]	0.37	4.14	0.17	9.30	0.16	0.65	11.20	11.27
95th-Percentile Queue Length [ft/ln]	9.20	103.48	4.26	232.54	3.93	16.16	279.95	281.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.28	37.28	37.28	41.72	41.72	41.72	12.93	6.20	1.88	10.51	7.58	7.63
Movement LOS	D	D	D	D	D	D	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	37.28			41.72			6.10			7.62		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.29											
Intersection LOS	A											
Intersection V/C	0.719											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.64	34.64	34.64	34.64
I_p,int, Pedestrian LOS Score for Intersection	1.801	1.789	2.943	2.969
Crosswalk LOS	A	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	469	469	1319	1319
d_b, Bicycle Delay [s]	26.35	26.36	5.23	5.24
I_b,int, Bicycle LOS Score for Intersection	1.576	1.730	3.271	3.394
Bicycle LOS	A	A	C	C

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	59.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.050

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	433	72	145	83	141	73	23	500	505	175	1678	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	433	72	145	83	141	73	23	500	505	175	1678	88
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	114	19	38	22	37	19	6	132	133	46	442	23
Total Analysis Volume [veh/h]	456	76	153	87	148	77	24	526	532	184	1766	93
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			17			18			10		
v_di, Inbound Pedestrian Volume crossing m	10			18			17			10		
v_co, Outbound Pedestrian Volume crossing	20			9			19			8		
v_ci, Inbound Pedestrian Volume crossing mi	19			8			20			9		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	2			4			1			5		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	24.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	23	23	23	23	27	27	27	27	27	27
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.45	0.45	0.45	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.40	0.14	0.08	0.13	0.10	0.28	0.36	0.35	0.50	0.51
s, saturation flow rate [veh/h]	1136	1615	1133	1735	247	1870	1489	532	1870	1828
c, Capacity [veh/h]	398	604	386	648	120	847	675	232	847	828
d1, Uniform Delay [s]	24.88	13.71	19.02	13.52	30.01	12.50	13.50	26.16	16.42	16.42
k, delay calibration	0.44	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	88.74	0.39	0.29	0.32	3.72	3.41	9.09	23.71	61.04	70.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.15	0.38	0.23	0.35	0.20	0.62	0.79	0.79	1.10	1.12
d, Delay for Lane Group [s/veh]	113.62	14.11	19.32	13.84	33.73	15.91	22.59	49.87	77.46	87.09
Lane Group LOS	F	B	B	B	C	B	C	D	F	F
Critical Lane Group	Yes	No	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	15.30	2.08	0.96	2.00	0.45	5.38	6.71	4.06	24.05	25.73
50th-Percentile Queue Length [ft/ln]	382.50	51.88	23.98	50.11	11.37	134.62	167.71	101.62	601.30	643.27
95th-Percentile Queue Length [veh/ln]	23.60	3.74	1.73	3.61	0.82	9.19	10.96	7.32	34.31	36.96
95th-Percentile Queue Length [ft/ln]	590.10	93.39	43.16	90.19	20.46	229.76	273.90	182.91	857.70	923.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	113.62	14.11	14.11	19.32	13.84	13.84	33.73	15.91	22.59	49.87	82.02	87.09
Movement LOS	F	B	B	B	B	B	C	B	C	D	F	F
d_A, Approach Delay [s/veh]	80.35			15.37			19.59			79.36		
Approach LOS	F			B			B			E		
d_I, Intersection Delay [s/veh]	58.99											
Intersection LOS	E											
Intersection V/C	1.050											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.683	2.116	3.585	2.914
Crosswalk LOS	B	B	D	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.69	9.08	9.10
I_b,int, Bicycle LOS Score for Intersection	2.690	2.074	3.345	3.245
Bicycle LOS	B	B	C	C

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	2.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.480

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	7	3	938	14	6	1396
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	3	938	14	6	1396
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	258	4	2	384
Total Analysis Volume [veh/h]	8	3	1031	15	7	1534
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		20		0	
v_di, Inbound Pedestrian Volume crossing m	0		19		0	
v_co, Outbound Pedestrian Volume crossing	20		20		19	
v_ci, Inbound Pedestrian Volume crossing mi	20		20		20	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	1		0		2	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	2	2	77	77	77	77
g / C, Green / Cycle	0.02	0.02	0.85	0.85	0.85	0.85
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.29	0.01	0.01	0.43
s, saturation flow rate [veh/h]	1188	1556	3560	1552	538	3560
c, Capacity [veh/h]	30	39	3035	1323	489	3035
d1, Uniform Delay [s]	43.03	42.82	1.38	0.99	2.63	1.72
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.67	0.82	0.30	0.02	0.05	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.08	0.34	0.01	0.01	0.51
d, Delay for Lane Group [s/veh]	47.70	43.64	1.68	1.00	2.68	2.32
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.21	0.07	0.70	0.02	0.03	1.31
50th-Percentile Queue Length [ft/ln]	5.30	1.84	17.48	0.44	0.73	32.87
95th-Percentile Queue Length [veh/ln]	0.38	0.13	1.26	0.03	0.05	2.37
95th-Percentile Queue Length [ft/ln]	9.54	3.31	31.47	0.79	1.32	59.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.70	43.64	1.68	1.00	2.68	2.32
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	46.59		1.67		2.32	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	2.25					
Intersection LOS	A					
Intersection V/C	0.480					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	295.73	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.960	2.804	0.000
Crosswalk LOS	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.39	13.40
I_b,int, Bicycle LOS Score for Intersection	1.560	2.423	2.831
Bicycle LOS	A	B	C

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	7.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	78	49	896	56	29	1340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	49	896	56	29	1340
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	13	241	15	8	360
Total Analysis Volume [veh/h]	84	53	963	60	31	1441
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6		1		7	
v_di, Inbound Pedestrian Volume crossing m	7		1		6	
v_co, Outbound Pedestrian Volume crossing	18		17		1	
v_ci, Inbound Pedestrian Volume crossing mi	17		18		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	12	67	67	67	67
g / C, Green / Cycle	0.14	0.75	0.75	0.75	0.75
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.28	0.06	0.40
s, saturation flow rate [veh/h]	1702	1870	1826	551	3560
c, Capacity [veh/h]	235	1396	1363	419	2657
d1, Uniform Delay [s]	36.34	3.98	4.02	7.07	4.86
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.62	0.74	0.79	0.34	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.58	0.37	0.38	0.07	0.54
d, Delay for Lane Group [s/veh]	40.96	4.73	4.81	7.42	5.66
Lane Group LOS	D	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.08	2.71	2.75	0.26	4.46
50th-Percentile Queue Length [ft/ln]	77.07	67.82	68.65	6.53	111.57
95th-Percentile Queue Length [veh/ln]	5.55	4.88	4.94	0.47	7.93
95th-Percentile Queue Length [ft/ln]	138.73	122.08	123.57	11.75	198.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.96	40.96	4.76	4.81	7.42	5.66
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	40.96		4.77		5.70	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	7.17					
Intersection LOS	A					
Intersection V/C	0.533					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	34.65	34.65
I_p,int, Pedestrian LOS Score for Intersection	1.870	2.752	2.857
Crosswalk LOS	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.16	11.14	11.14
I_b,int, Bicycle LOS Score for Intersection	1.786	2.404	2.774
Bicycle LOS	A	B	C

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	269.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.002

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	156	441	337	486	263	63	63	952	13	83	1003	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	100
Total Hourly Volume [veh/h]	156	441	337	486	263	63	63	952	13	83	1003	15
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	116	89	128	69	17	17	251	3	22	264	4
Total Analysis Volume [veh/h]	164	464	355	512	277	66	66	1002	14	87	1056	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	7			22			23			7		
v_di, Inbound Pedestrian Volume crossing m	7			23			22			7		
v_co, Outbound Pedestrian Volume crossing	14			15			13			14		
v_ci, Inbound Pedestrian Volume crossing mi	13			14			14			15		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			4			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.58	1.53	0.13	0.27	0.27	0.16	0.30	0.01
s, saturation flow rate [veh/h]	1685	560	526	1870	1858	555	3560	1509
c, Capacity [veh/h]	690	278	221	937	931	242	1784	756
d1, Uniform Delay [s]	28.84	31.73	27.48	15.34	15.35	26.75	15.87	11.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	199.07	943.43	3.42	2.26	2.29	4.13	1.45	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.42	3.08	0.30	0.54	0.54	0.36	0.59	0.02
d, Delay for Lane Group [s/veh]	227.92	975.15	30.91	17.61	17.64	30.89	17.33	11.33
Lane Group LOS	F	F	C	B	B	C	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	52.84	78.99	1.37	7.28	7.26	1.81	7.54	0.17
50th-Percentile Queue Length [ft/ln]	1320.97	1974.85	34.27	182.11	181.47	45.13	188.55	4.14
95th-Percentile Queue Length [veh/ln]	79.61	131.81	2.47	11.71	11.68	3.25	12.05	0.30
95th-Percentile Queue Length [ft/ln]	1990.31	3295.25	61.68	292.77	291.93	81.23	301.15	7.45

Movement, Approach, & Intersection Results

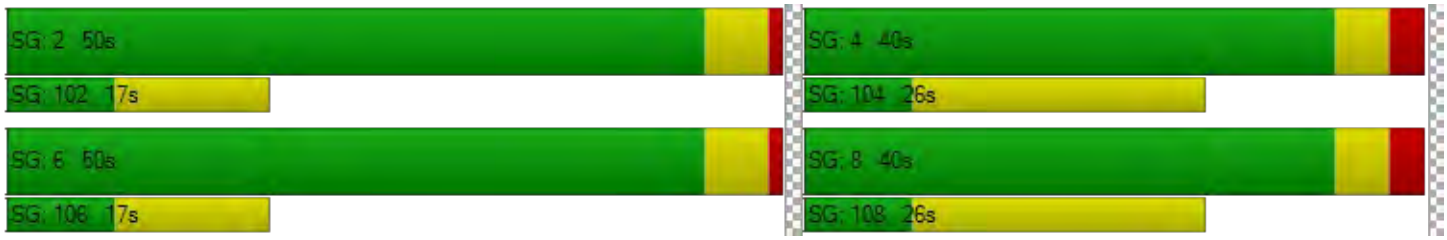
d_M, Delay for Movement [s/veh]	227.92	227.92	227.92	975.15	975.15	975.15	30.91	17.62	17.64	30.89	17.33	11.33
Movement LOS	F	F	F	F	F	F	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	227.92			975.15			18.43			18.26		
Approach LOS	F			F			B			B		
d_I, Intersection Delay [s/veh]	269.41											
Intersection LOS	F											
Intersection V/C	2.002											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.502	2.540	2.994	3.831
Crosswalk LOS	B	B	C	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.14	17.15	11.15	11.16
I_b,int, Bicycle LOS Score for Intersection	3.182	2.970	2.452	2.598
Bicycle LOS	C	C	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Scenario 6 Opening Year Weekday Midday
Report File: H:\...\OpeningYear_Midday.pdf
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	NB Left	0.683	8.5	A
2	Curson Ave/6th St	Signalized	HCM 6th Edition	SB Left	0.643	16.3	B
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.405	3.3	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.435	5.5	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	1.237	183.9	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	8.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.683

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	52	1	51	9	0	17	10	911	68	45	1169	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	1	51	9	0	17	10	911	68	45	1169	10
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	0	14	2	0	5	3	242	18	12	311	3
Total Analysis Volume [veh/h]	55	1	54	10	0	18	11	969	72	48	1244	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			4			4			13		
v_di, Inbound Pedestrian Volume crossing m	13			4			4			12		
v_co, Outbound Pedestrian Volume crossing	32			15			32			14		
v_ci, Inbound Pedestrian Volume crossing mi	32			14			32			15		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	2.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	9	9	42	42	42	42	42	42
g / C, Green / Cycle	0.15	0.15	0.69	0.69	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.07	0.02	0.02	0.52	0.05	0.09	0.34	0.34
s, saturation flow rate [veh/h]	1484	1597	442	1870	1485	542	1870	1863
c, Capacity [veh/h]	311	320	333	1292	1026	282	1292	1287
d1, Uniform Delay [s]	23.29	22.09	8.24	5.95	3.00	16.18	4.32	4.32
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.68	0.12	0.18	4.04	0.13	1.31	1.31	1.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.09	0.03	0.75	0.07	0.17	0.49	0.49
d, Delay for Lane Group [s/veh]	23.97	22.21	8.43	9.99	3.14	17.49	5.63	5.64
Lane Group LOS	C	C	A	A	A	B	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	1.39	0.33	0.08	5.96	0.21	0.56	2.59	2.59
50th-Percentile Queue Length [ft/ln]	34.87	8.32	2.04	149.05	5.17	14.11	64.86	64.78
95th-Percentile Queue Length [veh/ln]	2.51	0.60	0.15	9.97	0.37	1.02	4.67	4.66
95th-Percentile Queue Length [ft/ln]	62.77	14.98	3.67	249.16	9.31	25.40	116.75	116.60

Movement, Approach, & Intersection Results

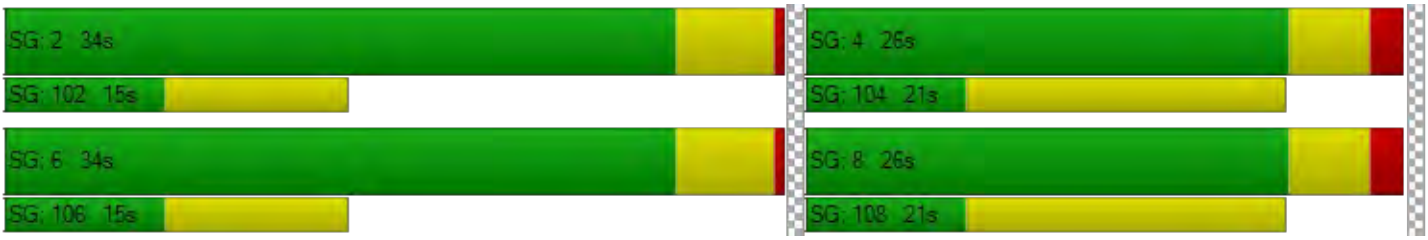
d_M, Delay for Movement [s/veh]	23.97	23.97	23.97	22.21	22.21	22.21	8.43	9.99	3.14	17.49	5.64	5.64
Movement LOS	C	C	C	C	C	C	A	A	A	B	A	A
d_A, Approach Delay [s/veh]	23.97			22.21			9.50			6.07		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	8.49											
Intersection LOS	A											
Intersection V/C	0.683											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersection	1.873	1.733	2.817	2.692
Crosswalk LOS	A	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	703	703	977	977
d_b, Bicycle Delay [s]	12.61	12.62	7.86	7.86
I_b,int, Bicycle LOS Score for Intersection	1.741	1.606	3.295	2.635
Bicycle LOS	A	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	322	56	310	42	39	54	38	519	176	81	582	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	322	56	310	42	39	54	38	519	176	81	582	49
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	85	15	82	11	10	14	10	137	46	21	153	13
Total Analysis Volume [veh/h]	339	59	326	44	41	57	40	546	185	85	613	52
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			10			11			12		
v_di, Inbound Pedestrian Volume crossing m	12			11			10			12		
v_co, Outbound Pedestrian Volume crossing	21			14			20			14		
v_ci, Inbound Pedestrian Volume crossing mi	20			14			21			14		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			3			2			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	22	22	22	22	27	27	27	27	27	27
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.46	0.46	0.46	0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.26	0.25	0.04	0.06	0.05	0.29	0.12	0.12	0.18	0.18
s, saturation flow rate [veh/h]	1280	1549	986	1663	765	1870	1485	721	1870	1809
c, Capacity [veh/h]	494	572	240	614	357	856	680	270	856	828
d1, Uniform Delay [s]	20.43	15.89	24.20	12.69	15.08	12.47	9.99	21.36	10.77	10.79
k, delay calibration	0.20	0.17	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.04	2.12	0.36	0.12	0.64	3.63	0.99	3.04	1.36	1.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	0.67	0.18	0.16	0.11	0.64	0.27	0.32	0.39	0.40
d, Delay for Lane Group [s/veh]	23.48	18.01	24.56	12.81	15.72	16.10	10.98	24.40	12.13	12.21
Lane Group LOS	C	B	C	B	B	B	B	C	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.52	4.23	0.56	0.81	0.43	5.63	1.48	1.22	2.86	2.80
50th-Percentile Queue Length [ft/ln]	112.91	105.87	14.10	20.32	10.69	140.72	37.01	30.62	71.56	70.11
95th-Percentile Queue Length [veh/ln]	8.00	7.61	1.02	1.46	0.77	9.52	2.66	2.20	5.15	5.05
95th-Percentile Queue Length [ft/ln]	200.04	190.24	25.39	36.58	19.25	238.00	66.62	55.11	128.81	126.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.48	18.01	18.01	24.56	12.81	12.81	15.72	16.10	10.98	24.40	12.17	12.21
Movement LOS	C	B	B	C	B	B	B	B	B	C	B	B
d_A, Approach Delay [s/veh]	20.57			16.45			14.85			13.56		
Approach LOS	C			B			B			B		
d_I, Intersection Delay [s/veh]	16.27											
Intersection LOS	B											
Intersection V/C	0.643											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.375	2.070	3.107	2.574
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.68	11.68	9.09	9.08
I_b,int, Bicycle LOS Score for Intersection	2.754	1.794	2.832	2.178
Bicycle LOS	C	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	3.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.405

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	11	23	1169	13	6	1003
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	23	1169	13	6	1003
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	314	3	2	270
Total Analysis Volume [veh/h]	12	25	1257	14	6	1078
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		46		0	
v_di, Inbound Pedestrian Volume crossing m	0		45		0	
v_co, Outbound Pedestrian Volume crossing	59		58		45	
v_ci, Inbound Pedestrian Volume crossing mi	58		59		46	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		3		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	5	5	74	74	74	74
g / C, Green / Cycle	0.06	0.06	0.82	0.82	0.82	0.82
(v / s)_i Volume / Saturation Flow Rate	0.01	0.02	0.35	0.01	0.01	0.30
s, saturation flow rate [veh/h]	1195	1559	3560	1444	434	3560
c, Capacity [veh/h]	73	96	2907	1179	377	2907
d1, Uniform Delay [s]	40.04	40.27	2.34	1.53	4.57	2.17
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.04	1.43	0.47	0.02	0.08	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.16	0.26	0.43	0.01	0.02	0.37
d, Delay for Lane Group [s/veh]	41.07	41.70	2.81	1.55	4.65	2.54
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.27	0.56	1.83	0.03	0.04	1.46
50th-Percentile Queue Length [ft/ln]	6.77	14.03	45.84	0.75	0.97	36.38
95th-Percentile Queue Length [veh/ln]	0.49	1.01	3.30	0.05	0.07	2.62
95th-Percentile Queue Length [ft/ln]	12.18	25.25	82.52	1.35	1.74	65.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.07	41.70	2.81	1.55	4.65	2.54
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	41.50		2.80		2.55	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	3.29					
Intersection LOS	A					
Intersection V/C	0.405					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	125.68	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.967	2.760	0.000
Crosswalk LOS	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.97	13.41	13.39
I_b,int, Bicycle LOS Score for Intersection	1.560	2.608	2.454
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	5.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.435

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	38	34	1133	54	29	971
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	34	1133	54	29	971
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	9	305	15	8	261
Total Analysis Volume [veh/h]	41	37	1218	58	31	1044
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	5		12		5	
v_di, Inbound Pedestrian Volume crossing m	5		11		5	
v_co, Outbound Pedestrian Volume crossing	48		47		11	
v_ci, Inbound Pedestrian Volume crossing mi	47		48		12	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		2		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	10	69	69	69	69
g / C, Green / Cycle	0.11	0.77	0.77	0.77	0.77
(v / s)_i Volume / Saturation Flow Rate	0.05	0.34	0.35	0.07	0.29
s, saturation flow rate [veh/h]	1685	1870	1823	433	3560
c, Capacity [veh/h]	193	1439	1403	347	2740
d1, Uniform Delay [s]	36.95	3.63	3.67	7.18	3.38
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.75	0.99	1.06	0.51	0.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.44	0.45	0.09	0.38
d, Delay for Lane Group [s/veh]	39.70	4.62	4.74	7.69	3.78
Lane Group LOS	D	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.72	3.17	3.23	0.27	2.27
50th-Percentile Queue Length [ft/ln]	43.05	79.28	80.67	6.84	56.74
95th-Percentile Queue Length [veh/ln]	3.10	5.71	5.81	0.49	4.09
95th-Percentile Queue Length [ft/ln]	77.49	142.71	145.21	12.32	102.14

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.70	39.70	4.68	4.74	7.69	3.78
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	39.70		4.68		3.90	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	5.46					
Intersection LOS	A					
Intersection V/C	0.435					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	1.840	2.706	2.831
Crosswalk LOS	A	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.18	11.15	11.15
I_b,int, Bicycle LOS Score for Intersection	1.688	2.612	2.446
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	183.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.237

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	277	597	255	167	112	104	94	1007	24	40	613	91
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	76
Total Hourly Volume [veh/h]	277	597	255	167	112	104	94	1007	24	40	613	15
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	157	67	44	29	27	25	265	6	11	161	4
Total Analysis Volume [veh/h]	292	628	268	176	118	109	99	1060	25	42	645	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	24			46			47			24		
v_di, Inbound Pedestrian Volume crossing m	24			47			46			24		
v_co, Outbound Pedestrian Volume crossing	42			56			42			55		
v_ci, Inbound Pedestrian Volume crossing mi	42			55			42			56		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			4			3			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.83	0.45	0.13	0.29	0.29	0.08	0.18	0.01
s, saturation flow rate [veh/h]	1424	899	765	1870	1843	520	3560	1413
c, Capacity [veh/h]	594	401	361	937	924	221	1784	708
d1, Uniform Delay [s]	29.18	29.44	20.65	15.75	15.80	25.91	13.64	11.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	456.11	46.20	1.88	2.63	2.71	1.90	0.57	0.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	2.00	1.01	0.27	0.58	0.59	0.19	0.36	0.02
d, Delay for Lane Group [s/veh]	485.29	75.65	22.53	18.38	18.51	27.81	14.21	11.34
Lane Group LOS	F	F	C	B	B	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	88.03	14.00	1.66	8.04	8.01	0.82	3.91	0.17
50th-Percentile Queue Length [ft/ln]	2200.79	349.95	41.41	200.92	200.26	20.38	97.74	4.16
95th-Percentile Queue Length [veh/ln]	140.86	20.20	2.98	12.69	12.65	1.47	7.04	0.30
95th-Percentile Queue Length [ft/ln]	3521.49	505.07	74.53	317.15	316.30	36.69	175.94	7.48

Movement, Approach, & Intersection Results

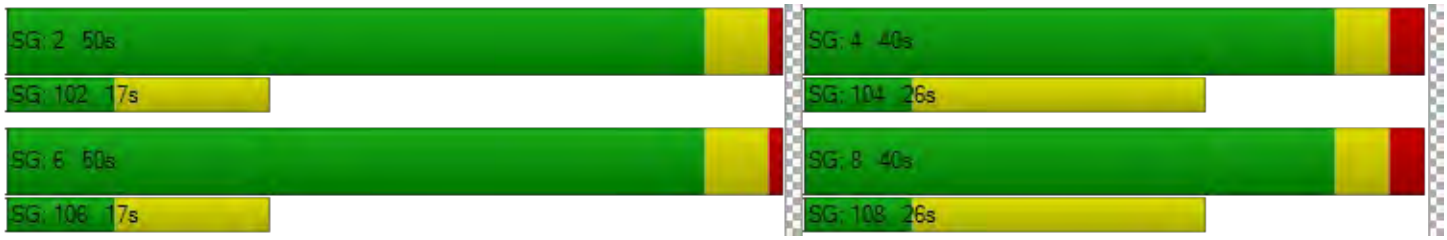
d_M, Delay for Movement [s/veh]	485.29	485.29	485.29	75.65	75.65	75.65	22.53	18.44	18.51	27.81	14.21	11.34
Movement LOS	F	F	F	E	E	E	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	485.29			75.65			18.79			14.95		
Approach LOS	F			E			B			B		
d_I, Intersection Delay [s/veh]	183.95											
Intersection LOS	F											
Intersection V/C	1.237											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.443	2.451	3.149	3.182
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.11	17.15	11.16	11.14
I_b,int, Bicycle LOS Score for Intersection	3.520	2.225	2.536	2.202
Bicycle LOS	D	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Scenario 7 Opening Year Weekday PM
Report File: H:\...\OpeningYear_PM.pdf
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	NB Left	0.799	11.3	B
2	Curson Ave/6th St	Signalized	HCM 6th Edition	NB Right	1.071	54.7	D
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.650	5.8	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.664	8.3	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	1.674	249.8	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.799

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	80	0	78	14	0	27	38	1072	29	16	1013	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	0	78	14	0	27	38	1072	29	16	1013	12
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	0	21	4	0	7	10	288	8	4	272	3
Total Analysis Volume [veh/h]	86	0	84	15	0	29	41	1153	31	17	1089	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6			9			10			6		
v_di, Inbound Pedestrian Volume crossing m	6			10			9			6		
v_co, Outbound Pedestrian Volume crossing	16			18			16			18		
v_ci, Inbound Pedestrian Volume crossing mi	16			18			16			18		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	64	0	0	64	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	13	13	67	67	67	67	67	67
g / C, Green / Cycle	0.14	0.14	0.75	0.75	0.75	0.75	0.75	0.75
(v / s)_i Volume / Saturation Flow Rate	0.11	0.03	0.08	0.62	0.02	0.04	0.30	0.30
s, saturation flow rate [veh/h]	1529	1567	511	1870	1524	473	1870	1860
c, Capacity [veh/h]	279	278	396	1403	1143	232	1403	1395
d1, Uniform Delay [s]	36.79	33.92	7.13	7.31	2.86	21.55	3.98	3.98
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.15	0.26	0.52	5.54	0.04	0.62	0.83	0.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.61	0.16	0.10	0.82	0.03	0.07	0.39	0.39
d, Delay for Lane Group [s/veh]	38.94	34.19	7.65	12.85	2.90	22.17	4.81	4.82
Lane Group LOS	D	C	A	B	A	C	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	3.69	0.86	0.35	12.24	0.12	0.29	2.95	2.94
50th-Percentile Queue Length [ft/ln]	92.31	21.46	8.85	305.96	3.00	7.20	73.74	73.53
95th-Percentile Queue Length [veh/ln]	6.65	1.54	0.64	17.98	0.22	0.52	5.31	5.29
95th-Percentile Queue Length [ft/ln]	166.16	38.62	15.93	449.39	5.40	12.96	132.73	132.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.94	38.94	38.94	34.19	34.19	34.19	7.65	12.85	2.90	22.17	4.81	4.82
Movement LOS	D	D	D	C	C	C	A	B	A	C	A	A
d_A, Approach Delay [s/veh]	38.94			34.19			12.43			5.08		
Approach LOS	D			C			B			A		
d_I, Intersection Delay [s/veh]	11.35											
Intersection LOS	B											
Intersection V/C	0.799											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.64	34.64	34.64	34.64
I_p,int, Pedestrian LOS Score for Intersection	1.845	1.820	2.895	2.730
Crosswalk LOS	A	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	469	469	1319	1319
d_b, Bicycle Delay [s]	26.35	26.35	5.22	5.23
I_b,int, Bicycle LOS Score for Intersection	1.840	1.632	3.581	2.483
Bicycle LOS	A	A	D	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	54.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.071

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	363	85	546	75	73	41	52	923	195	96	628	98
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	363	85	546	75	73	41	52	923	195	96	628	98
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	94	22	141	19	19	11	13	238	50	25	162	25
Total Analysis Volume [veh/h]	374	88	563	77	75	42	54	952	201	99	647	101
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			16			16			10		
v_di, Inbound Pedestrian Volume crossing m	10			16			16			10		
v_co, Outbound Pedestrian Volume crossing	30			10			30			9		
v_ci, Inbound Pedestrian Volume crossing mi	30			9			30			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	2			1			2			5		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	17.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	23	23	23	23	27	27	27	27	27	27
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.45	0.45	0.45	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.30	0.42	0.10	0.07	0.08	0.51	0.14	0.20	0.20	0.21
s, saturation flow rate [veh/h]	1250	1553	776	1732	711	1870	1452	487	1870	1758
c, Capacity [veh/h]	486	581	122	647	320	847	658	120	847	796
d1, Uniform Delay [s]	21.43	18.79	30.01	12.62	16.77	16.42	10.28	30.01	11.29	11.34
k, delay calibration	0.26	0.47	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.04	74.55	5.30	0.13	1.14	70.95	1.20	45.07	1.74	1.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	1.12	0.63	0.18	0.17	1.12	0.31	0.83	0.45	0.46
d, Delay for Lane Group [s/veh]	27.47	93.35	35.31	12.75	17.90	87.37	11.48	75.08	13.03	13.24
Lane Group LOS	C	F	D	B	B	F	B	E	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	5.56	19.00	1.24	0.97	0.63	26.38	1.66	2.87	3.42	3.31
50th-Percentile Queue Length [ft/ln]	138.91	475.09	31.02	24.22	15.85	659.59	41.49	71.66	85.55	82.67
95th-Percentile Queue Length [veh/ln]	9.42	28.16	2.23	1.74	1.14	37.82	2.99	5.16	6.16	5.95
95th-Percentile Queue Length [ft/ln]	235.56	703.89	55.84	43.59	28.53	945.47	74.68	128.99	153.99	148.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.47	93.35	93.35	35.31	12.75	12.75	17.90	87.37	11.48	75.08	13.12	13.24
Movement LOS	C	F	F	D	B	B	B	F	B	E	B	B
d_A, Approach Delay [s/veh]	69.31			21.71			71.62			20.38		
Approach LOS	E			C			E			C		
d_I, Intersection Delay [s/veh]	54.68											
Intersection LOS	D											
Intersection V/C	1.071											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.513	2.137	3.252	2.809
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.67	9.09	9.10
I_b,int, Bicycle LOS Score for Intersection	3.251	1.880	3.551	2.258
Bicycle LOS	C	A	D	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	5.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	32	37	1885	38	18	1047
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	37	1885	38	18	1047
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	10	501	10	5	278
Total Analysis Volume [veh/h]	34	39	2005	40	19	1114
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		70		0	
v_di, Inbound Pedestrian Volume crossing m	0		70		0	
v_co, Outbound Pedestrian Volume crossing	65		64		70	
v_ci, Inbound Pedestrian Volume crossing mi	64		65		70	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		6		3	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	8	8	71	71	71	71
g / C, Green / Cycle	0.08	0.08	0.79	0.79	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.56	0.03	0.09	0.31
s, saturation flow rate [veh/h]	1177	1589	3560	1427	206	3560
c, Capacity [veh/h]	100	135	2823	1131	181	2823
d1, Uniform Delay [s]	38.80	38.62	4.42	1.98	12.90	2.81
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.00	1.17	1.54	0.06	1.16	0.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.29	0.71	0.04	0.11	0.39
d, Delay for Lane Group [s/veh]	40.80	39.79	5.96	2.04	14.07	3.22
Lane Group LOS	D	D	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.76	0.84	5.84	0.11	0.26	2.01
50th-Percentile Queue Length [ft/ln]	18.89	21.09	145.90	2.80	6.62	50.26
95th-Percentile Queue Length [veh/ln]	1.36	1.52	9.80	0.20	0.48	3.62
95th-Percentile Queue Length [ft/ln]	34.01	37.96	244.95	5.03	11.92	90.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.80	39.79	5.96	2.04	14.07	3.22
Movement LOS	D	D	A	A	B	A
d_A, Approach Delay [s/veh]	40.26		5.88		3.40	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	5.79					
Intersection LOS	A					
Intersection V/C	0.650					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	81.06	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.010	2.922	0.000
Crosswalk LOS	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.43	13.41
I_b,int, Bicycle LOS Score for Intersection	1.560	3.247	2.494
Bicycle LOS	A	C	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.664

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	35	51	1885	45	24	1017
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	51	1885	45	24	1017
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	13	496	12	6	268
Total Analysis Volume [veh/h]	37	54	1984	47	25	1071
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6		14		7	
v_di, Inbound Pedestrian Volume crossing m	7		14		6	
v_co, Outbound Pedestrian Volume crossing	42		41		14	
v_ci, Inbound Pedestrian Volume crossing mi	41		42		14	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		7		5	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	11	68	68	68	68
g / C, Green / Cycle	0.13	0.76	0.76	0.76	0.76
(v / s)_i Volume / Saturation Flow Rate	0.05	0.54	0.55	0.12	0.30
s, saturation flow rate [veh/h]	1662	1870	1847	209	3560
c, Capacity [veh/h]	209	1418	1401	170	2700
d1, Uniform Delay [s]	36.35	5.74	5.83	16.64	3.75
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.88	3.12	3.30	1.82	0.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.72	0.73	0.15	0.40
d, Delay for Lane Group [s/veh]	39.24	8.87	9.13	18.46	4.19
Lane Group LOS	D	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.99	8.22	8.38	0.41	2.57
50th-Percentile Queue Length [ft/ln]	49.85	205.41	209.44	10.22	64.29
95th-Percentile Queue Length [veh/ln]	3.59	12.92	13.12	0.74	4.63
95th-Percentile Queue Length [ft/ln]	89.74	322.94	328.11	18.40	115.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.24	39.24	9.00	9.13	18.46	4.19
Movement LOS	D	D	A	A	B	A
d_A, Approach Delay [s/veh]	39.24		9.00		4.52	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	8.33					
Intersection LOS	A					
Intersection V/C	0.664					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	1.829	2.896	2.962
Crosswalk LOS	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.17	11.18	11.17
I_b,int, Bicycle LOS Score for Intersection	1.710	3.235	2.464
Bicycle LOS	A	C	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	249.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.674

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	332	751	309	179	167	62	155	1709	56	49	654	91
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	86
Total Hourly Volume [veh/h]	332	751	309	179	167	62	155	1709	56	49	654	5
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	87	198	81	47	44	16	41	450	15	13	172	1
Total Analysis Volume [veh/h]	349	791	325	188	176	65	163	1799	59	52	688	5
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			36			36			20		
v_di, Inbound Pedestrian Volume crossing m	20			36			36			20		
v_co, Outbound Pedestrian Volume crossing	20			31			19			31		
v_ci, Inbound Pedestrian Volume crossing mi	19			31			20			31		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	5			3			5			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	1.02	0.49	0.22	0.50	0.50	0.21	0.19	0.00
s, saturation flow rate [veh/h]	1437	876	747	1870	1840	247	3560	1457
c, Capacity [veh/h]	598	392	348	937	922	80	1784	730
d1, Uniform Delay [s]	29.16	29.55	23.66	22.19	22.38	44.85	13.84	11.20
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	656.83	73.19	4.49	27.44	31.50	33.89	0.63	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	2.45	1.09	0.47	0.99	1.01	0.65	0.39	0.01
d, Delay for Lane Group [s/veh]	685.99	102.74	28.15	49.64	53.88	78.74	14.47	11.22
Lane Group LOS	F	F	C	D	F	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	122.04	16.63	3.17	24.81	25.75	1.90	4.24	0.05
50th-Percentile Queue Length [ft/ln]	3050.92	415.70	79.31	620.19	643.72	47.60	105.91	1.29
95th-Percentile Queue Length [veh/ln]	196.86	24.72	5.71	32.98	34.28	3.43	7.61	0.09
95th-Percentile Queue Length [ft/ln]	4921.59	617.94	142.76	824.40	856.96	85.69	190.30	2.31

Movement, Approach, & Intersection Results

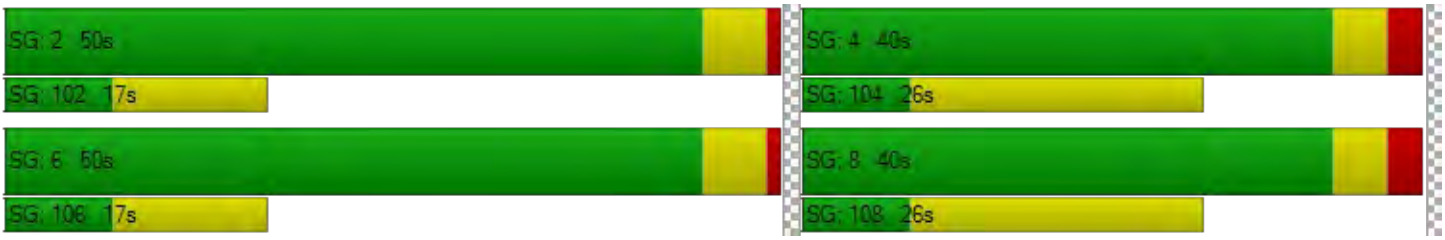
d_M, Delay for Movement [s/veh]	685.99	685.99	685.99	102.74	102.74	102.74	28.15	51.69	53.88	78.74	14.47	11.22
Movement LOS	F	F	F	F	F	F	C	D	D	E	B	B
d_A, Approach Delay [s/veh]	685.99			102.74			49.85			18.94		
Approach LOS	F			F			D			B		
d_I, Intersection Delay [s/veh]	249.77											
Intersection LOS	F											
Intersection V/C	1.674											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.642	2.665	3.405	3.353
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.15	17.14	11.17	11.17
I_b,int, Bicycle LOS Score for Intersection	3.977	2.267	3.227	2.245
Bicycle LOS	D	B	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

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Report File: H:\...\OpeningYear_Saturday.pdf

Scenario 8 Opening Year Weekend Midday
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	WB Left	0.774	11.3	B
2	Curson Ave/6th St	Signalized	HCM 6th Edition	SB Left	0.534	14.3	B
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.371	3.9	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.426	8.6	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	1.267	211.5	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.774

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	100	0	86	17	0	40	28	978	149	90	1246	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	0	86	17	0	40	28	978	149	90	1246	6
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	22	4	0	10	7	255	39	23	324	2
Total Analysis Volume [veh/h]	104	0	90	18	0	42	29	1019	155	94	1298	6
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			1			2			8		
v_di, Inbound Pedestrian Volume crossing m	8			2			1			8		
v_co, Outbound Pedestrian Volume crossing	20			16			19			15		
v_ci, Inbound Pedestrian Volume crossing mi	19			15			20			16		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	2.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	10	10	40	40	40	40	40	40
g / C, Green / Cycle	0.17	0.17	0.67	0.67	0.67	0.67	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.13	0.04	0.07	0.54	0.10	0.20	0.35	0.35
s, saturation flow rate [veh/h]	1546	1663	422	1870	1511	478	1870	1866
c, Capacity [veh/h]	363	370	306	1243	1004	223	1243	1240
d1, Uniform Delay [s]	23.03	21.17	10.05	7.42	3.74	22.96	5.18	5.19
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.22	0.20	0.61	6.13	0.33	5.74	1.59	1.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.16	0.09	0.82	0.15	0.42	0.52	0.53
d, Delay for Lane Group [s/veh]	24.25	21.38	10.66	13.55	4.07	28.70	6.77	6.78
Lane Group LOS	C	C	B	B	A	C	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	2.51	0.70	0.25	8.13	0.55	1.55	3.24	3.24
50th-Percentile Queue Length [ft/ln]	62.78	17.46	6.29	203.18	13.80	38.63	80.96	80.92
95th-Percentile Queue Length [veh/ln]	4.52	1.26	0.45	12.80	0.99	2.78	5.83	5.83
95th-Percentile Queue Length [ft/ln]	113.01	31.43	11.32	320.06	24.85	69.54	145.72	145.65

Movement, Approach, & Intersection Results

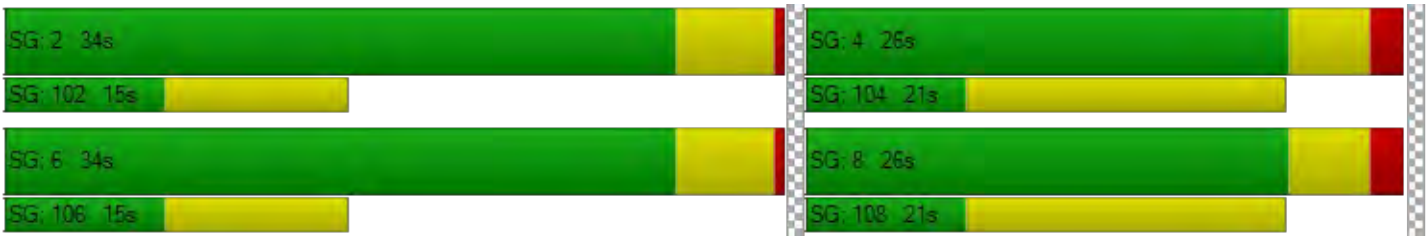
d_M, Delay for Movement [s/veh]	24.25	24.25	24.25	21.38	21.38	21.38	10.66	13.55	4.07	28.70	6.78	6.78
Movement LOS	C	C	C	C	C	C	B	B	A	C	A	A
d_A, Approach Delay [s/veh]	24.25			21.38			12.26			8.25		
Approach LOS	C			C			B			A		
d_I, Intersection Delay [s/veh]	11.30											
Intersection LOS	B											
Intersection V/C	0.774											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersection	2.042	1.780	2.941	2.750
Crosswalk LOS	B	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	703	703	977	977
d_b, Bicycle Delay [s]	12.61	12.62	7.86	7.87
I_b,int, Bicycle LOS Score for Intersection	1.880	1.659	3.545	2.713
Bicycle LOS	A	A	D	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.534

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	263	49	262	53	60	35	43	462	168	92	563	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	263	49	262	53	60	35	43	462	168	92	563	61
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	13	67	14	15	9	11	118	43	23	144	16
Total Analysis Volume [veh/h]	268	50	267	54	61	36	44	471	171	94	574	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			14			15			13		
v_di, Inbound Pedestrian Volume crossing m	13			15			14			12		
v_co, Outbound Pedestrian Volume crossing	29			17			28			17		
v_ci, Inbound Pedestrian Volume crossing mi	28			17			29			17		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			1			1			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	20	20	20	20	30	30	30	30	30	30
g / C, Green / Cycle	0.33	0.33	0.33	0.33	0.49	0.49	0.49	0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.05	0.06	0.06	0.25	0.12	0.12	0.17	0.18
s, saturation flow rate [veh/h]	1272	1543	1045	1727	785	1870	1467	779	1870	1783
c, Capacity [veh/h]	448	515	250	576	399	922	723	349	922	879
d1, Uniform Delay [s]	20.94	16.77	24.26	14.12	13.20	10.31	8.64	17.03	9.32	9.35
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.28	1.20	0.43	0.14	0.56	2.02	0.77	1.89	1.05	1.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.62	0.22	0.17	0.11	0.51	0.24	0.27	0.35	0.36
d, Delay for Lane Group [s/veh]	22.22	17.97	24.69	14.25	13.75	12.33	9.41	18.93	10.37	10.48
Lane Group LOS	C	B	C	B	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	3.38	3.45	0.70	0.87	0.43	4.02	1.22	1.13	2.45	2.39
50th-Percentile Queue Length [ft/ln]	84.46	86.25	17.41	21.66	10.71	100.62	30.55	28.37	61.13	59.73
95th-Percentile Queue Length [veh/ln]	6.08	6.21	1.25	1.56	0.77	7.24	2.20	2.04	4.40	4.30
95th-Percentile Queue Length [ft/ln]	152.03	155.25	31.34	38.98	19.27	181.12	54.99	51.06	110.03	107.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.22	17.97	17.97	24.69	14.25	14.25	13.75	12.33	9.41	18.93	10.42	10.48
Movement LOS	C	B	B	C	B	B	B	B	A	B	B	B
d_A, Approach Delay [s/veh]	19.92			17.99			11.69			11.52		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.31											
Intersection LOS	B											
Intersection V/C	0.534											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.347	2.080	2.964	2.553
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.66	9.08	9.09
I_b,int, Bicycle LOS Score for Intersection	2.525	1.809	2.692	2.162
Bicycle LOS	B	A	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	3.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	8	43	998	27	2	916
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	43	998	27	2	916
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	12	274	7	1	252
Total Analysis Volume [veh/h]	9	47	1097	30	2	1007
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		46		0	
v_di, Inbound Pedestrian Volume crossing m	0		45		0	
v_co, Outbound Pedestrian Volume crossing	52		51		45	
v_ci, Inbound Pedestrian Volume crossing mi	51		52		46	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		1		4	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	7	7	72	72	72	72
g / C, Green / Cycle	0.08	0.08	0.80	0.80	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.31	0.02	0.00	0.28
s, saturation flow rate [veh/h]	1226	1589	3560	1457	497	3560
c, Capacity [veh/h]	94	121	2854	1168	419	2854
d1, Uniform Delay [s]	38.67	39.55	2.56	1.81	4.58	2.47
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.44	2.02	0.39	0.04	0.02	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	0.39	0.38	0.03	0.00	0.35
d, Delay for Lane Group [s/veh]	39.11	41.57	2.96	1.85	4.60	2.82
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.19	1.05	1.79	0.08	0.01	1.59
50th-Percentile Queue Length [ft/ln]	4.87	26.17	44.85	1.91	0.31	39.67
95th-Percentile Queue Length [veh/ln]	0.35	1.88	3.23	0.14	0.02	2.86
95th-Percentile Queue Length [ft/ln]	8.77	47.11	80.72	3.44	0.57	71.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.11	41.57	2.96	1.85	4.60	2.82
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	41.17		2.93		2.82	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	3.85					
Intersection LOS	A					
Intersection V/C	0.371					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	125.68	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.971	2.717	0.000
Crosswalk LOS	A	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.39	13.41
I_b,int, Bicycle LOS Score for Intersection	1.560	2.489	2.392
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	8.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.426

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	45	64	939	95	49	860
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	64	939	95	49	860
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	17	255	26	13	234
Total Analysis Volume [veh/h]	49	70	1021	103	53	935
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	23		22		24	
v_di, Inbound Pedestrian Volume crossing m	24		22		23	
v_co, Outbound Pedestrian Volume crossing	48		48		22	
v_ci, Inbound Pedestrian Volume crossing mi	48		48		22	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		1		5	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	18	62	62	62	62
g / C, Green / Cycle	0.20	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.32	0.11	0.26
s, saturation flow rate [veh/h]	1663	1870	1775	501	3560
c, Capacity [veh/h]	330	1283	1218	335	2443
d1, Uniform Delay [s]	31.14	6.33	6.48	12.11	6.01
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.36	1.09	1.26	1.01	0.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.44	0.46	0.16	0.38
d, Delay for Lane Group [s/veh]	32.49	7.42	7.74	13.11	6.46
Lane Group LOS	C	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.32	4.36	4.49	0.65	3.29
50th-Percentile Queue Length [ft/ln]	58.10	109.05	112.34	16.22	82.26
95th-Percentile Queue Length [veh/ln]	4.18	7.79	7.97	1.17	5.92
95th-Percentile Queue Length [ft/ln]	104.58	194.68	199.25	29.19	148.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.49	32.49	7.56	7.74	13.11	6.46
Movement LOS	C	C	A	A	B	A
d_A, Approach Delay [s/veh]	32.49		7.58		6.82	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	8.57					
Intersection LOS	A					
Intersection V/C	0.426					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	34.65	34.65
I_p,int, Pedestrian LOS Score for Intersection	1.924	2.644	2.790
Crosswalk LOS	A	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.18	11.14	11.16
I_b,int, Bicycle LOS Score for Intersection	1.756	2.487	2.375
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	211.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.267

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	238	614	217	151	197	131	114	859	27	35	525	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	9
Total Hourly Volume [veh/h]	238	614	217	151	197	131	114	859	27	35	525	62
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	165	58	41	53	35	31	231	7	9	141	17
Total Analysis Volume [veh/h]	256	660	233	162	212	141	123	924	29	38	565	67
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			53			53			21		
v_di, Inbound Pedestrian Volume crossing m	21			53			53			20		
v_co, Outbound Pedestrian Volume crossing	36			51			36			50		
v_ci, Inbound Pedestrian Volume crossing mi	36			50			36			51		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			3			3			6		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.90	0.51	0.16	0.26	0.26	0.06	0.16	0.05
s, saturation flow rate [veh/h]	1282	1013	783	1870	1837	589	3560	1394
c, Capacity [veh/h]	539	440	380	937	920	259	1784	699
d1, Uniform Delay [s]	29.29	29.06	20.26	15.01	15.05	23.20	13.27	11.66
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	516.14	98.93	2.25	1.99	2.06	1.19	0.47	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	2.13	1.17	0.32	0.51	0.52	0.15	0.32	0.10
d, Delay for Lane Group [s/veh]	545.43	127.98	22.50	17.00	17.11	24.39	13.74	11.93
Lane Group LOS	F	F	C	B	B	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	88.89	21.79	2.06	6.68	6.64	0.67	3.33	0.72
50th-Percentile Queue Length [ft/ln]	2222.29	544.68	51.57	167.01	165.96	16.83	83.21	18.06
95th-Percentile Queue Length [veh/ln]	143.54	32.55	3.71	10.92	10.86	1.21	5.99	1.30
95th-Percentile Queue Length [ft/ln]	3588.51	813.78	92.82	272.98	271.60	30.30	149.79	32.50

Movement, Approach, & Intersection Results

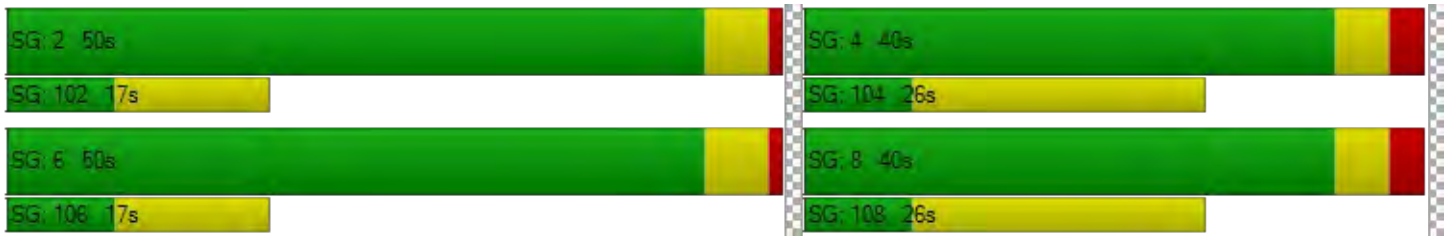
d_M, Delay for Movement [s/veh]	545.43	545.43	545.43	127.98	127.98	127.98	22.50	17.05	17.11	24.39	13.74	11.93
Movement LOS	F	F	F	F	F	F	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	545.43			127.98			17.68			14.16		
Approach LOS	F			F			B			B		
d_I, Intersection Delay [s/veh]	211.47											
Intersection LOS	F											
Intersection V/C	1.267											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.464	2.559	3.061	3.020
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.14	17.14	11.16	11.18
I_b,int, Bicycle LOS Score for Intersection	3.455	2.409	2.447	2.120
Bicycle LOS	C	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix 8 — Opening Year (2032) With Project Intersection LOS and Queuing Worksheets

La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Scenario 9 Opening Year + Project Weekday AM
Report File: H:\...\OpeningYearwithProject_AM.pdf
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	SB Right	0.719	8.3	A
2	Curson Ave/6th St	Signalized	HCM 6th Edition	NB Left	1.050	59.0	E
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.480	2.2	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.533	7.2	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	SB Left	2.002	269.2	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.719

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	3	0	7	30	0	70	7	969	36	33	2102	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	0	7	30	0	70	7	969	36	33	2102	22
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	2	8	0	18	2	250	9	9	542	6
Total Analysis Volume [veh/h]	3	0	7	31	0	72	7	999	37	34	2167	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			3			3			2		
v_di, Inbound Pedestrian Volume crossing m	2			3			3			2		
v_co, Outbound Pedestrian Volume crossing	7			6			7			6		
v_ci, Inbound Pedestrian Volume crossing mi	7			6			7			6		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			3			7		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	69.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	64	0	0	64	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	8	8	72	72	72	72	72	72
g / C, Green / Cycle	0.09	0.09	0.80	0.80	0.80	0.80	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.04	0.53	0.02	0.06	0.59	0.59
s, saturation flow rate [veh/h]	1708	1537	179	1870	1542	544	1870	1862
c, Capacity [veh/h]	211	195	167	1496	1234	375	1496	1489
d1, Uniform Delay [s]	37.19	39.51	12.46	3.86	1.84	10.11	4.33	4.36
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	2.20	0.47	2.38	0.05	0.48	3.20	3.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.53	0.04	0.67	0.03	0.09	0.73	0.74
d, Delay for Lane Group [s/veh]	37.28	41.72	12.93	6.23	1.88	10.59	7.53	7.63
Lane Group LOS	D	D	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.20	2.30	0.09	5.50	0.10	0.36	6.89	6.95
50th-Percentile Queue Length [ft/ln]	5.11	57.49	2.37	137.62	2.38	9.02	172.31	173.73
95th-Percentile Queue Length [veh/ln]	0.37	4.14	0.17	9.35	0.17	0.65	11.20	11.27
95th-Percentile Queue Length [ft/ln]	9.20	103.48	4.26	233.82	4.28	16.24	279.95	281.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.28	37.28	37.28	41.72	41.72	41.72	12.93	6.23	1.88	10.59	7.58	7.63
Movement LOS	D	D	D	D	D	D	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	37.28			41.72			6.13			7.62		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.29											
Intersection LOS	A											
Intersection V/C	0.719											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.64	34.64	34.64	34.64
I_p,int, Pedestrian LOS Score for Intersection	1.802	1.789	2.944	2.970
Crosswalk LOS	A	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	469	469	1319	1319
d_b, Bicycle Delay [s]	26.35	26.36	5.23	5.24
I_b,int, Bicycle LOS Score for Intersection	1.576	1.730	3.281	3.394
Bicycle LOS	A	A	C	C

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	59.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.050

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	433	72	145	83	141	73	23	500	505	176	1678	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	433	72	145	83	141	73	23	500	505	176	1678	88
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	114	19	38	22	37	19	6	132	133	46	442	23
Total Analysis Volume [veh/h]	456	76	153	87	148	77	24	526	532	185	1766	93
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			17			18			10		
v_di, Inbound Pedestrian Volume crossing m	10			18			17			10		
v_co, Outbound Pedestrian Volume crossing	20			9			19			8		
v_ci, Inbound Pedestrian Volume crossing mi	19			8			20			9		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	2			4			1			5		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	24.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	23	23	23	23	27	27	27	27	27	27
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.45	0.45	0.45	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.40	0.14	0.08	0.13	0.10	0.28	0.36	0.35	0.50	0.51
s, saturation flow rate [veh/h]	1136	1615	1133	1735	247	1870	1489	532	1870	1828
c, Capacity [veh/h]	398	604	386	648	120	847	675	232	847	828
d1, Uniform Delay [s]	24.88	13.71	19.02	13.52	30.01	12.50	13.50	26.18	16.42	16.42
k, delay calibration	0.44	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	88.74	0.39	0.29	0.32	3.72	3.41	9.09	24.15	61.04	70.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.15	0.38	0.23	0.35	0.20	0.62	0.79	0.80	1.10	1.12
d, Delay for Lane Group [s/veh]	113.62	14.11	19.32	13.84	33.73	15.91	22.59	50.33	77.46	87.09
Lane Group LOS	F	B	B	B	C	B	C	D	F	F
Critical Lane Group	Yes	No	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	15.30	2.08	0.96	2.00	0.45	5.38	6.71	4.11	24.05	25.73
50th-Percentile Queue Length [ft/ln]	382.50	51.88	23.98	50.11	11.37	134.62	167.71	102.67	601.30	643.27
95th-Percentile Queue Length [veh/ln]	23.60	3.74	1.73	3.61	0.82	9.19	10.96	7.39	34.31	36.96
95th-Percentile Queue Length [ft/ln]	590.10	93.39	43.16	90.19	20.46	229.76	273.90	184.80	857.70	923.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	113.62	14.11	14.11	19.32	13.84	13.84	33.73	15.91	22.59	50.33	82.02	87.09
Movement LOS	F	B	B	B	B	B	C	B	C	D	F	F
d_A, Approach Delay [s/veh]	80.35			15.37			19.59			79.38		
Approach LOS	F			B			B			E		
d_I, Intersection Delay [s/veh]	59.01											
Intersection LOS	E											
Intersection V/C	1.050											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.685	2.116	3.585	2.914
Crosswalk LOS	B	B	D	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.69	9.08	9.10
I_b,int, Bicycle LOS Score for Intersection	2.690	2.074	3.345	3.246
Bicycle LOS	B	B	C	C

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	2.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.480

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	7	3	941	14	6	1396
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	3	941	14	6	1396
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	259	4	2	384
Total Analysis Volume [veh/h]	8	3	1034	15	7	1534
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		20		0	
v_di, Inbound Pedestrian Volume crossing m	0		19		0	
v_co, Outbound Pedestrian Volume crossing	20		20		19	
v_ci, Inbound Pedestrian Volume crossing mi	20		20		20	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	1		0		2	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	2	2	77	77	77	77
g / C, Green / Cycle	0.02	0.02	0.85	0.85	0.85	0.85
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.29	0.01	0.01	0.43
s, saturation flow rate [veh/h]	1188	1556	3560	1552	536	3560
c, Capacity [veh/h]	30	39	3035	1323	487	3035
d1, Uniform Delay [s]	43.03	42.82	1.38	0.99	2.64	1.72
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.67	0.82	0.31	0.02	0.05	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.08	0.34	0.01	0.01	0.51
d, Delay for Lane Group [s/veh]	47.70	43.64	1.68	1.00	2.69	2.32
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.21	0.07	0.70	0.02	0.03	1.31
50th-Percentile Queue Length [ft/ln]	5.30	1.84	17.56	0.44	0.73	32.87
95th-Percentile Queue Length [veh/ln]	0.38	0.13	1.26	0.03	0.05	2.37
95th-Percentile Queue Length [ft/ln]	9.54	3.31	31.60	0.79	1.32	59.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.70	43.64	1.68	1.00	2.69	2.32
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	46.59		1.68		2.32	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	2.25					
Intersection LOS	A					
Intersection V/C	0.480					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	295.73	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.960	2.805	0.000
Crosswalk LOS	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.39	13.40
I_b,int, Bicycle LOS Score for Intersection	1.560	2.425	2.831
Bicycle LOS	A	B	C

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	7.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	78	49	899	56	29	1340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	49	899	56	29	1340
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	13	242	15	8	360
Total Analysis Volume [veh/h]	84	53	967	60	31	1441
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6		1		7	
v_di, Inbound Pedestrian Volume crossing m	7		1		6	
v_co, Outbound Pedestrian Volume crossing	18		17		1	
v_ci, Inbound Pedestrian Volume crossing mi	17		18		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	12	67	67	67	67
g / C, Green / Cycle	0.14	0.75	0.75	0.75	0.75
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.28	0.06	0.40
s, saturation flow rate [veh/h]	1702	1870	1826	549	3560
c, Capacity [veh/h]	235	1396	1363	417	2657
d1, Uniform Delay [s]	36.34	3.99	4.02	7.09	4.86
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.62	0.75	0.80	0.35	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.58	0.37	0.38	0.07	0.54
d, Delay for Lane Group [s/veh]	40.96	4.74	4.82	7.44	5.66
Lane Group LOS	D	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.08	2.73	2.76	0.26	4.46
50th-Percentile Queue Length [ft/ln]	77.07	68.19	69.03	6.54	111.57
95th-Percentile Queue Length [veh/ln]	5.55	4.91	4.97	0.47	7.93
95th-Percentile Queue Length [ft/ln]	138.73	122.75	124.25	11.78	198.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.96	40.96	4.78	4.82	7.44	5.66
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	40.96		4.78		5.70	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	7.17					
Intersection LOS	A					
Intersection V/C	0.533					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	34.65	34.65
I_p,int, Pedestrian LOS Score for Intersection	1.870	2.753	2.857
Crosswalk LOS	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.16	11.14	11.14
I_b,int, Bicycle LOS Score for Intersection	1.786	2.407	2.774
Bicycle LOS	A	B	C

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	269.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.002

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	156	441	337	486	263	63	66	952	13	83	1003	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	101
Total Hourly Volume [veh/h]	156	441	337	486	263	63	66	952	13	83	1003	15
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	116	89	128	69	17	17	251	3	22	264	4
Total Analysis Volume [veh/h]	164	464	355	512	277	66	69	1002	14	87	1056	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	7			22			23			7		
v_di, Inbound Pedestrian Volume crossing m	7			23			22			7		
v_co, Outbound Pedestrian Volume crossing	14			15			13			14		
v_ci, Inbound Pedestrian Volume crossing mi	13			14			14			15		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			4			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.58	1.53	0.13	0.27	0.27	0.16	0.30	0.01
s, saturation flow rate [veh/h]	1685	560	526	1870	1858	555	3560	1509
c, Capacity [veh/h]	690	278	221	937	931	242	1784	756
d1, Uniform Delay [s]	28.84	31.73	27.66	15.34	15.35	26.75	15.87	11.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	199.07	943.43	3.64	2.26	2.29	4.13	1.45	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.42	3.08	0.31	0.54	0.54	0.36	0.59	0.02
d, Delay for Lane Group [s/veh]	227.92	975.15	31.31	17.61	17.64	30.89	17.33	11.33
Lane Group LOS	F	F	C	B	B	C	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	52.84	78.99	1.45	7.28	7.26	1.81	7.54	0.17
50th-Percentile Queue Length [ft/ln]	1320.97	1974.85	36.13	182.11	181.47	45.13	188.55	4.14
95th-Percentile Queue Length [veh/ln]	79.61	131.81	2.60	11.71	11.68	3.25	12.05	0.30
95th-Percentile Queue Length [ft/ln]	1990.31	3295.25	65.03	292.77	291.93	81.23	301.15	7.45

Movement, Approach, & Intersection Results

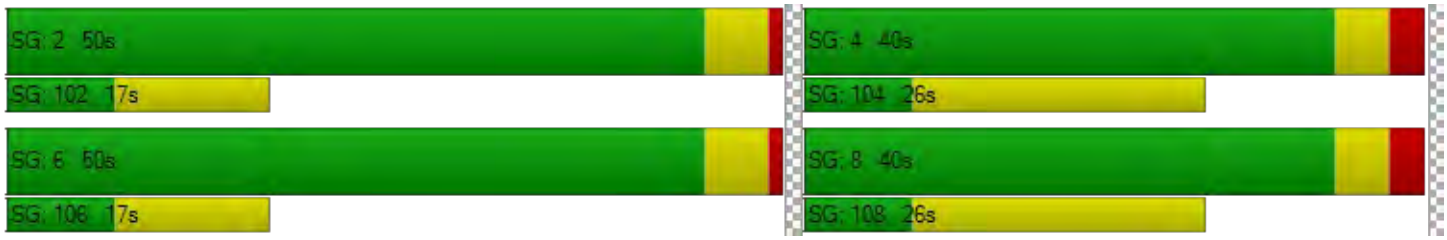
d_M, Delay for Movement [s/veh]	227.92	227.92	227.92	975.15	975.15	975.15	31.31	17.62	17.64	30.89	17.33	11.33
Movement LOS	F	F	F	F	F	F	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	227.92			975.15			18.49			18.26		
Approach LOS	F			F			B			B		
d_I, Intersection Delay [s/veh]	269.24											
Intersection LOS	F											
Intersection V/C	2.002											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.502	2.546	2.995	3.833
Crosswalk LOS	B	B	C	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.14	17.15	11.15	11.16
I_b,int, Bicycle LOS Score for Intersection	3.182	2.970	2.455	2.599
Bicycle LOS	C	C	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Scenario 10 Opening Year + Project Weekday Midday
Report File: H:\...\OpeningYearwithProject_Midday.pdf
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	NB Left	0.744	10.2	B
2	Curson Ave/6th St	Signalized	HCM 6th Edition	WB Left	0.651	16.4	B
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.413	3.3	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.442	5.5	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	1.286	206.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	10.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.744

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	102	1	51	9	0	17	10	941	95	45	1201	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	102	1	51	9	0	17	10	941	95	45	1201	10
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	0	14	2	0	5	3	250	25	12	319	3
Total Analysis Volume [veh/h]	109	1	54	10	0	18	11	1001	101	48	1278	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			4			4			13		
v_di, Inbound Pedestrian Volume crossing m	13			4			4			12		
v_co, Outbound Pedestrian Volume crossing	32			15			32			14		
v_ci, Inbound Pedestrian Volume crossing mi	32			14			32			15		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	2.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	10	10	40	40	40	40	40	40
g / C, Green / Cycle	0.17	0.17	0.67	0.67	0.67	0.67	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.11	0.02	0.03	0.54	0.07	0.09	0.35	0.35
s, saturation flow rate [veh/h]	1499	1648	428	1870	1482	511	1870	1863
c, Capacity [veh/h]	358	365	313	1249	990	242	1249	1244
d1, Uniform Delay [s]	22.83	20.93	9.32	7.11	3.53	19.19	5.05	5.05
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.92	0.09	0.21	5.47	0.21	1.83	1.53	1.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.08	0.04	0.80	0.10	0.20	0.52	0.52
d, Delay for Lane Group [s/veh]	23.74	21.01	9.53	12.59	3.74	21.02	6.58	6.59
Lane Group LOS	C	C	A	B	A	C	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	2.09	0.32	0.09	7.56	0.34	0.64	3.12	3.12
50th-Percentile Queue Length [ft/ln]	52.18	8.01	2.22	189.05	8.51	16.03	78.02	77.93
95th-Percentile Queue Length [veh/ln]	3.76	0.58	0.16	12.07	0.61	1.15	5.62	5.61
95th-Percentile Queue Length [ft/ln]	93.92	14.42	4.00	301.79	15.31	28.86	140.43	140.28

Movement, Approach, & Intersection Results

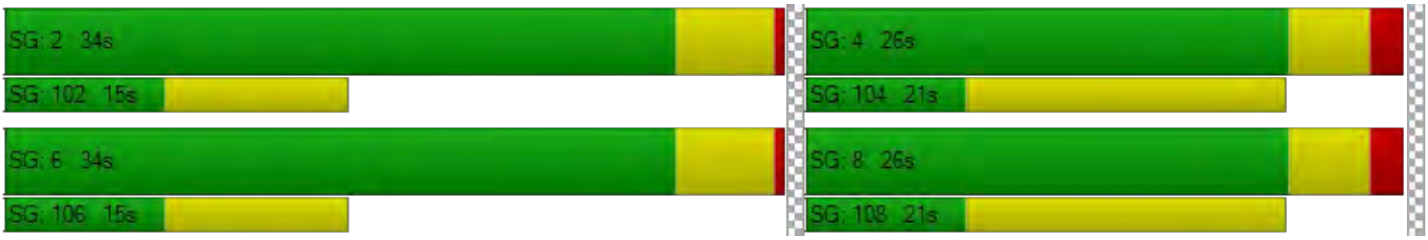
d_M, Delay for Movement [s/veh]	23.74	23.74	23.74	21.01	21.01	21.01	9.53	12.59	3.74	21.02	6.58	6.59
Movement LOS	C	C	C	C	C	C	A	B	A	C	A	A
d_A, Approach Delay [s/veh]	23.74			21.01			11.75			7.10		
Approach LOS	C			C			B			A		
d_I, Intersection Delay [s/veh]	10.24											
Intersection LOS	B											
Intersection V/C	0.744											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersection	1.913	1.733	2.923	2.708
Crosswalk LOS	A	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	703	703	977	977
d_b, Bicycle Delay [s]	12.61	12.62	7.86	7.86
I_b,int, Bicycle LOS Score for Intersection	1.830	1.606	3.396	2.663
Bicycle LOS	A	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	16.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.651

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	322	56	310	42	39	54	38	531	176	87	582	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	322	56	310	42	39	54	38	531	176	87	582	49
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	85	15	82	11	10	14	10	140	46	23	153	13
Total Analysis Volume [veh/h]	339	59	326	44	41	57	40	559	185	92	613	52
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			10			11			12		
v_di, Inbound Pedestrian Volume crossing m	12			11			10			12		
v_co, Outbound Pedestrian Volume crossing	21			14			20			14		
v_ci, Inbound Pedestrian Volume crossing mi	20			14			21			14		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			3			2			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	22	22	22	22	27	27	27	27	27	27
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.46	0.46	0.46	0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.26	0.25	0.04	0.06	0.05	0.30	0.12	0.13	0.18	0.18
s, saturation flow rate [veh/h]	1280	1549	986	1663	765	1870	1485	713	1870	1809
c, Capacity [veh/h]	494	572	240	614	357	856	680	263	856	828
d1, Uniform Delay [s]	20.43	15.89	24.20	12.69	15.08	12.60	9.99	22.04	10.77	10.79
k, delay calibration	0.20	0.17	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.04	2.12	0.36	0.12	0.64	3.87	0.99	3.65	1.36	1.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	0.67	0.18	0.16	0.11	0.65	0.27	0.35	0.39	0.40
d, Delay for Lane Group [s/veh]	23.48	18.01	24.56	12.81	15.71	16.47	10.98	25.69	12.13	12.21
Lane Group LOS	C	B	C	B	B	B	B	C	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.52	4.23	0.56	0.81	0.43	5.85	1.48	1.37	2.86	2.80
50th-Percentile Queue Length [ft/ln]	112.91	105.87	14.10	20.32	10.69	146.20	37.01	34.31	71.56	70.11
95th-Percentile Queue Length [veh/ln]	8.00	7.61	1.02	1.46	0.77	9.81	2.66	2.47	5.15	5.05
95th-Percentile Queue Length [ft/ln]	200.04	190.24	25.39	36.58	19.25	245.34	66.62	61.75	128.81	126.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.48	18.01	18.01	24.56	12.81	12.81	15.71	16.47	10.98	25.69	12.17	12.21
Movement LOS	C	B	B	C	B	B	B	B	B	C	B	B
d_A, Approach Delay [s/veh]	20.57			16.45			15.13			13.81		
Approach LOS	C			B			B			B		
d_I, Intersection Delay [s/veh]	16.43											
Intersection LOS	B											
Intersection V/C	0.651											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.387	2.070	3.109	2.579
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.68	11.68	9.09	9.08
I_b,int, Bicycle LOS Score for Intersection	2.754	1.794	2.853	2.184
Bicycle LOS	C	A	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	3.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.413

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	11	23	1193	13	6	1070
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	23	1193	13	6	1070
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	321	3	2	288
Total Analysis Volume [veh/h]	12	25	1283	14	6	1151
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		46		0	
v_di, Inbound Pedestrian Volume crossing m	0		45		0	
v_co, Outbound Pedestrian Volume crossing	59		58		45	
v_ci, Inbound Pedestrian Volume crossing mi	58		59		46	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		3		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	5	5	74	74	74	74
g / C, Green / Cycle	0.06	0.06	0.82	0.82	0.82	0.82
(v / s)_i Volume / Saturation Flow Rate	0.01	0.02	0.36	0.01	0.01	0.32
s, saturation flow rate [veh/h]	1195	1559	3560	1444	424	3560
c, Capacity [veh/h]	73	96	2907	1179	368	2907
d1, Uniform Delay [s]	40.04	40.27	2.37	1.53	4.67	2.24
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.04	1.43	0.49	0.02	0.08	0.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.16	0.26	0.44	0.01	0.02	0.40
d, Delay for Lane Group [s/veh]	41.07	41.70	2.86	1.55	4.75	2.65
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.27	0.56	1.89	0.03	0.04	1.60
50th-Percentile Queue Length [ft/ln]	6.77	14.03	47.35	0.75	0.98	40.06
95th-Percentile Queue Length [veh/ln]	0.49	1.01	3.41	0.05	0.07	2.88
95th-Percentile Queue Length [ft/ln]	12.18	25.25	85.23	1.35	1.77	72.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.07	41.70	2.86	1.55	4.75	2.65
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	41.50		2.84		2.66	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	3.33					
Intersection LOS	A					
Intersection V/C	0.413					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	125.68	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.967	2.779	0.000
Crosswalk LOS	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.97	13.41	13.39
I_b,int, Bicycle LOS Score for Intersection	1.560	2.630	2.514
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	5.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.442

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	38	34	1157	54	29	1038
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	34	1157	54	29	1038
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	9	311	15	8	279
Total Analysis Volume [veh/h]	41	37	1244	58	31	1116
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	5		12		5	
v_di, Inbound Pedestrian Volume crossing m	5		11		5	
v_co, Outbound Pedestrian Volume crossing	48		47		11	
v_ci, Inbound Pedestrian Volume crossing mi	47		48		12	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		2		1	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	10	69	69	69	69
g / C, Green / Cycle	0.11	0.77	0.77	0.77	0.77
(v / s)_i Volume / Saturation Flow Rate	0.05	0.35	0.36	0.07	0.31
s, saturation flow rate [veh/h]	1685	1870	1824	423	3560
c, Capacity [veh/h]	193	1439	1404	338	2740
d1, Uniform Delay [s]	36.95	3.66	3.71	7.35	3.48
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.75	1.03	1.10	0.54	0.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.45	0.46	0.09	0.41
d, Delay for Lane Group [s/veh]	39.70	4.69	4.82	7.88	3.93
Lane Group LOS	D	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.72	3.27	3.33	0.28	2.50
50th-Percentile Queue Length [ft/ln]	43.05	81.82	83.26	6.97	62.51
95th-Percentile Queue Length [veh/ln]	3.10	5.89	5.99	0.50	4.50
95th-Percentile Queue Length [ft/ln]	77.49	147.27	149.87	12.55	112.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.70	39.70	4.75	4.82	7.88	3.93
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	39.70		4.76		4.04	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	5.51					
Intersection LOS	A					
Intersection V/C	0.442					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	1.840	2.730	2.847
Crosswalk LOS	A	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.18	11.15	11.15
I_b,int, Bicycle LOS Score for Intersection	1.688	2.634	2.506
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	206.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.286

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	277	597	271	185	112	171	118	1007	24	40	613	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	85
Total Hourly Volume [veh/h]	277	597	271	185	112	171	118	1007	24	40	613	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	157	71	49	29	45	31	265	6	11	161	4
Total Analysis Volume [veh/h]	292	628	285	195	118	180	124	1060	25	42	645	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	24			46			47			24		
v_di, Inbound Pedestrian Volume crossing m	24			47			46			24		
v_co, Outbound Pedestrian Volume crossing	42			56			42			55		
v_ci, Inbound Pedestrian Volume crossing mi	42			55			42			56		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			4			3			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.88	0.54	0.16	0.29	0.29	0.08	0.18	0.01
s, saturation flow rate [veh/h]	1372	919	764	1870	1843	520	3560	1413
c, Capacity [veh/h]	574	407	361	937	924	221	1784	708
d1, Uniform Delay [s]	29.23	29.59	21.46	15.75	15.80	25.91	13.64	11.29
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	501.01	115.73	2.59	2.63	2.71	1.90	0.57	0.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	2.10	1.21	0.34	0.58	0.59	0.19	0.36	0.02
d, Delay for Lane Group [s/veh]	530.24	145.32	24.06	18.38	18.51	27.81	14.21	11.35
Lane Group LOS	F	F	C	B	B	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	92.23	22.08	2.17	8.04	8.01	0.82	3.91	0.18
50th-Percentile Queue Length [ft/ln]	2305.67	551.89	54.28	200.90	200.28	20.38	97.74	4.42
95th-Percentile Queue Length [veh/ln]	148.31	33.52	3.91	12.69	12.65	1.47	7.04	0.32
95th-Percentile Queue Length [ft/ln]	3707.83	837.94	97.70	317.13	316.32	36.69	175.94	7.95

Movement, Approach, & Intersection Results

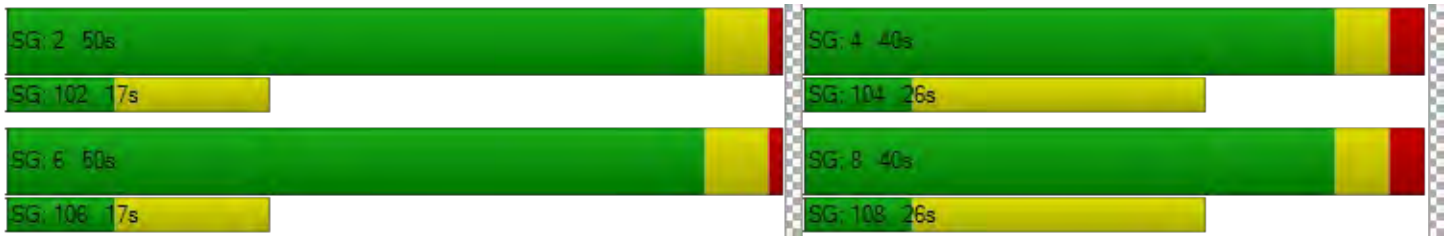
d_M, Delay for Movement [s/veh]	530.24	530.24	530.24	145.32	145.32	145.32	24.06	18.44	18.51	27.81	14.21	11.35
Movement LOS	F	F	F	F	F	F	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	530.24			145.32			19.02			14.95		
Approach LOS	F			F			B			B		
d_I, Intersection Delay [s/veh]	206.07											
Intersection LOS	F											
Intersection V/C	1.286											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.452	2.547	3.168	3.229
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.11	17.15	11.16	11.14
I_b,int, Bicycle LOS Score for Intersection	3.548	2.373	2.557	2.211
Bicycle LOS	D	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Scenario 11 Opening Year + Project Weekday PM
Report File: H:\...\OpeningYearwithProject_PM.pdf
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	NB Left	0.815	12.3	B
2	Curson Ave/6th St	Signalized	HCM 6th Edition	NB Right	1.074	55.3	E
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Left	0.651	5.8	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.665	8.3	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	1.692	257.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.815

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	97	0	78	14	0	27	38	1076	33	16	1025	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	0	78	14	0	27	38	1076	33	16	1025	12
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	21	4	0	7	10	289	9	4	276	3
Total Analysis Volume [veh/h]	104	0	84	15	0	29	41	1157	35	17	1102	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6			9			10			6		
v_di, Inbound Pedestrian Volume crossing m	6			10			9			6		
v_co, Outbound Pedestrian Volume crossing	16			18			16			18		
v_ci, Inbound Pedestrian Volume crossing mi	16			18			16			18		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	64	0	0	64	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	14	14	66	66	66	66	66	66
g / C, Green / Cycle	0.15	0.15	0.74	0.74	0.74	0.74	0.74	0.74
(v / s)_i Volume / Saturation Flow Rate	0.12	0.03	0.08	0.62	0.02	0.04	0.30	0.30
s, saturation flow rate [veh/h]	1520	1566	505	1870	1523	470	1870	1860
c, Capacity [veh/h]	296	295	384	1382	1126	216	1382	1375
d1, Uniform Delay [s]	36.33	33.05	7.79	8.02	3.13	23.61	4.36	4.36
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.25	0.23	0.56	6.17	0.05	0.71	0.88	0.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.63	0.15	0.11	0.84	0.03	0.08	0.40	0.40
d, Delay for Lane Group [s/veh]	38.57	33.28	8.35	14.19	3.18	24.33	5.24	5.25
Lane Group LOS	D	C	A	B	A	C	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.08	0.84	0.38	13.39	0.15	0.31	3.23	3.22
50th-Percentile Queue Length [ft/ln]	102.01	21.11	9.39	334.65	3.65	7.63	80.75	80.52
95th-Percentile Queue Length [veh/ln]	7.34	1.52	0.68	19.39	0.26	0.55	5.81	5.80
95th-Percentile Queue Length [ft/ln]	183.62	37.99	16.90	484.65	6.57	13.74	145.34	144.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.57	38.57	38.57	33.28	33.28	33.28	8.35	14.19	3.18	24.33	5.25	5.25
Movement LOS	D	D	D	C	C	C	A	B	A	C	A	A
d_A, Approach Delay [s/veh]	38.57			33.28			13.69			5.53		
Approach LOS	D			C			B			A		
d_I, Intersection Delay [s/veh]	12.27											
Intersection LOS	B											
Intersection V/C	0.815											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.64	34.64	34.64	34.64
I_p,int, Pedestrian LOS Score for Intersection	1.856	1.820	2.929	2.734
Crosswalk LOS	A	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	469	469	1319	1319
d_b, Bicycle Delay [s]	26.35	26.35	5.22	5.23
I_b,int, Bicycle LOS Score for Intersection	1.870	1.632	3.594	2.494
Bicycle LOS	A	A	D	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	55.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.074

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	363	85	546	75	73	41	52	927	195	97	628	98
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	363	85	546	75	73	41	52	927	195	97	628	98
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	94	22	141	19	19	11	13	239	50	25	162	25
Total Analysis Volume [veh/h]	374	88	563	77	75	42	54	956	201	100	647	101
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			16			16			10		
v_di, Inbound Pedestrian Volume crossing m	10			16			16			10		
v_co, Outbound Pedestrian Volume crossing	30			10			30			9		
v_ci, Inbound Pedestrian Volume crossing mi	30			9			30			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	2			1			2			5		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	17.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	23	23	23	23	27	27	27	27	27	27
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.45	0.45	0.45	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.30	0.42	0.10	0.07	0.08	0.51	0.14	0.21	0.20	0.21
s, saturation flow rate [veh/h]	1250	1553	776	1732	711	1870	1452	486	1870	1758
c, Capacity [veh/h]	486	581	122	647	320	847	658	120	847	796
d1, Uniform Delay [s]	21.43	18.79	30.01	12.62	16.77	16.42	10.28	30.01	11.29	11.34
k, delay calibration	0.26	0.47	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.04	74.55	5.30	0.13	1.14	72.76	1.20	46.42	1.74	1.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	1.12	0.63	0.18	0.17	1.13	0.31	0.83	0.45	0.46
d, Delay for Lane Group [s/veh]	27.47	93.35	35.31	12.75	17.90	89.18	11.48	76.44	13.03	13.24
Lane Group LOS	C	F	D	B	B	F	B	E	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	5.56	19.00	1.24	0.97	0.63	26.81	1.66	2.93	3.42	3.31
50th-Percentile Queue Length [ft/ln]	138.91	475.09	31.02	24.22	15.85	670.24	41.49	73.14	85.55	82.67
95th-Percentile Queue Length [veh/ln]	9.42	28.16	2.23	1.74	1.14	38.46	2.99	5.27	6.16	5.95
95th-Percentile Queue Length [ft/ln]	235.56	703.89	55.84	43.59	28.53	961.58	74.68	131.64	154.00	148.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.47	93.35	93.35	35.31	12.75	12.75	17.90	89.18	11.48	76.44	13.12	13.24
Movement LOS	C	F	F	D	B	B	B	F	B	E	B	B
d_A, Approach Delay [s/veh]	69.31			21.71			73.10			20.60		
Approach LOS	E			C			E			C		
d_I, Intersection Delay [s/veh]	55.29											
Intersection LOS	E											
Intersection V/C	1.074											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.515	2.137	3.253	2.810
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.67	9.09	9.10
I_b,int, Bicycle LOS Score for Intersection	3.251	1.880	3.558	2.259
Bicycle LOS	C	A	D	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	5.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.651

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	32	37	1889	38	18	1070
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	37	1889	38	18	1070
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	10	502	10	5	285
Total Analysis Volume [veh/h]	34	39	2010	40	19	1138
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		70		0	
v_di, Inbound Pedestrian Volume crossing m	0		70		0	
v_co, Outbound Pedestrian Volume crossing	65		64		70	
v_ci, Inbound Pedestrian Volume crossing mi	64		65		70	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		6		3	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	8	8	71	71	71	71
g / C, Green / Cycle	0.08	0.08	0.79	0.79	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.56	0.03	0.09	0.32
s, saturation flow rate [veh/h]	1177	1589	3560	1427	205	3560
c, Capacity [veh/h]	100	135	2823	1131	180	2823
d1, Uniform Delay [s]	38.80	38.62	4.43	1.98	12.99	2.83
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.00	1.17	1.56	0.06	1.18	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.29	0.71	0.04	0.11	0.40
d, Delay for Lane Group [s/veh]	40.80	39.79	5.99	2.04	14.16	3.26
Lane Group LOS	D	D	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.76	0.84	5.87	0.11	0.27	2.07
50th-Percentile Queue Length [ft/ln]	18.89	21.09	146.78	2.80	6.65	51.87
95th-Percentile Queue Length [veh/ln]	1.36	1.52	9.84	0.20	0.48	3.73
95th-Percentile Queue Length [ft/ln]	34.01	37.96	246.12	5.03	11.97	93.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.80	39.79	5.99	2.04	14.16	3.26
Movement LOS	D	D	A	A	B	A
d_A, Approach Delay [s/veh]	40.26		5.91		3.44	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	5.80					
Intersection LOS	A					
Intersection V/C	0.651					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	81.06	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.010	2.928	0.000
Crosswalk LOS	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.43	13.41
I_b,int, Bicycle LOS Score for Intersection	1.560	3.251	2.514
Bicycle LOS	A	C	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.665

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	35	51	1889	45	24	1040
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	51	1889	45	24	1040
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	13	497	12	6	274
Total Analysis Volume [veh/h]	37	54	1988	47	25	1095
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	6		14		7	
v_di, Inbound Pedestrian Volume crossing m	7		14		6	
v_co, Outbound Pedestrian Volume crossing	42		41		14	
v_ci, Inbound Pedestrian Volume crossing mi	41		42		14	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		7		5	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	11	68	68	68	68
g / C, Green / Cycle	0.13	0.76	0.76	0.76	0.76
(v / s)_i Volume / Saturation Flow Rate	0.05	0.54	0.55	0.12	0.31
s, saturation flow rate [veh/h]	1662	1870	1847	208	3560
c, Capacity [veh/h]	209	1418	1401	169	2700
d1, Uniform Delay [s]	36.35	5.76	5.85	16.72	3.79
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.88	3.14	3.32	1.84	0.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.72	0.73	0.15	0.41
d, Delay for Lane Group [s/veh]	39.24	8.90	9.17	18.56	4.24
Lane Group LOS	D	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.99	8.25	8.42	0.41	2.66
50th-Percentile Queue Length [ft/ln]	49.85	206.37	210.43	10.26	66.39
95th-Percentile Queue Length [veh/ln]	3.59	12.97	13.18	0.74	4.78
95th-Percentile Queue Length [ft/ln]	89.74	324.17	329.38	18.46	119.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.24	39.24	9.03	9.17	18.56	4.24
Movement LOS	D	D	A	A	B	A
d_A, Approach Delay [s/veh]	39.24		9.04		4.56	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	8.34					
Intersection LOS	A					
Intersection V/C	0.665					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	34.66
I_p,int, Pedestrian LOS Score for Intersection	1.829	2.903	2.966
Crosswalk LOS	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.17	11.18	11.17
I_b,int, Bicycle LOS Score for Intersection	1.710	3.238	2.484
Bicycle LOS	A	C	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	257.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.692

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	332	751	314	185	167	85	159	1709	56	49	654	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	86
Total Hourly Volume [veh/h]	332	751	314	185	167	85	159	1709	56	49	654	6
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	87	198	83	49	44	22	42	450	15	13	172	2
Total Analysis Volume [veh/h]	349	791	331	195	176	89	167	1799	59	52	688	6
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			36			36			20		
v_di, Inbound Pedestrian Volume crossing m	20			36			36			20		
v_co, Outbound Pedestrian Volume crossing	20			31			19			31		
v_ci, Inbound Pedestrian Volume crossing mi	19			31			20			31		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	5			3			5			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	1.04	0.52	0.22	0.50	0.50	0.21	0.19	0.00
s, saturation flow rate [veh/h]	1419	882	746	1870	1840	247	3560	1457
c, Capacity [veh/h]	592	394	347	937	922	80	1784	730
d1, Uniform Delay [s]	29.18	29.62	23.83	22.19	22.38	44.85	13.84	11.21
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	674.04	99.54	4.71	27.44	31.50	33.89	0.63	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	2.49	1.17	0.48	0.99	1.01	0.65	0.39	0.01
d, Delay for Lane Group [s/veh]	703.22	129.16	28.54	49.64	53.88	78.74	14.47	11.23
Lane Group LOS	F	F	C	D	F	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	123.49	19.59	3.28	24.81	25.75	1.90	4.24	0.06
50th-Percentile Queue Length [ft/ln]	3087.26	489.75	82.01	620.19	643.72	47.60	105.91	1.54
95th-Percentile Queue Length [veh/ln]	199.35	29.59	5.90	32.98	34.28	3.43	7.61	0.11
95th-Percentile Queue Length [ft/ln]	4983.67	739.82	147.61	824.40	856.96	85.69	190.31	2.78

Movement, Approach, & Intersection Results

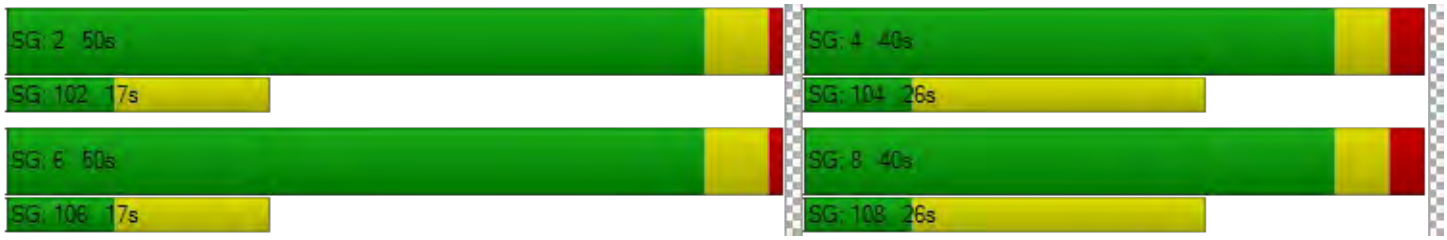
d_M, Delay for Movement [s/veh]	703.22	703.22	703.22	129.16	129.16	129.16	28.54	51.69	53.88	78.74	14.47	11.23
Movement LOS	F	F	F	F	F	F	C	D	D	E	B	B
d_A, Approach Delay [s/veh]	703.22			129.16			49.84			18.93		
Approach LOS	F			F			D			B		
d_I, Intersection Delay [s/veh]	257.10											
Intersection LOS	F											
Intersection V/C	1.692											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.645	2.688	3.410	3.365
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.15	17.14	11.17	11.17
I_b,int, Bicycle LOS Score for Intersection	3.987	2.319	3.230	2.246
Bicycle LOS	D	B	C	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



La Brea Tar Pits Museum Master Plan EIR

Vistro File: H:\...\26066_Vistro_20220404.vistro
Scenario 12 Opening Year + Project Weekend Midday
Report File: H:\...\OpeningYearwithProject_Saturday.pdf
6/30/2022

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Ogden Dr/LACMA Parking Garage/6th St	Signalized	HCM 6th Edition	WB Left	0.829	14.0	B
2	Curson Ave/6th St	Signalized	HCM 6th Edition	SB Left	0.539	14.4	B
3	Ogden Dr/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.381	3.9	A
4	Spaulding Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Right	0.436	8.7	A
5	Curson Ave/Wilshire Blvd	Signalized	HCM 6th Edition	NB Thru	1.292	226.7	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Ogden Dr/LACMA Parking Garage/6th St

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.829

Intersection Setup

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.00	140.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	LACMA Parking Garage			S Ogden Drive			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	135	0	86	17	0	40	28	1019	185	90	1269	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	135	0	86	17	0	40	28	1019	185	90	1269	6
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	0	22	4	0	10	7	265	48	23	330	2
Total Analysis Volume [veh/h]	141	0	90	18	0	42	29	1061	193	94	1322	6
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			1			2			8		
v_di, Inbound Pedestrian Volume crossing m	8			2			1			8		
v_co, Outbound Pedestrian Volume crossing	20			16			19			15		
v_ci, Inbound Pedestrian Volume crossing mi	19			15			20			16		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	2.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.3	0.0	0.0	4.3	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0
Split [s]	0	26	0	0	26	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	8	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	0.0	2.7	0.0	0.0	2.7	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.90	4.90	4.70	4.70	4.70	4.70	4.70	4.70
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.70	2.70	2.70	2.70	2.70	2.70
g_i, Effective Green Time [s]	12	12	39	39	39	39	39	39
g / C, Green / Cycle	0.20	0.20	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.15	0.04	0.07	0.57	0.13	0.21	0.36	0.36
s, saturation flow rate [veh/h]	1531	1646	413	1870	1509	443	1870	1866
c, Capacity [veh/h]	401	406	285	1199	967	175	1199	1196
d1, Uniform Delay [s]	22.32	19.97	11.58	8.94	4.40	27.79	6.00	6.00
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.31	0.17	0.71	9.75	0.46	11.25	1.85	1.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.58	0.15	0.10	0.89	0.20	0.54	0.55	0.55
d, Delay for Lane Group [s/veh]	23.63	20.14	12.30	18.69	4.87	39.04	7.85	7.86
Lane Group LOS	C	C	B	B	A	D	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	2.97	0.67	0.28	10.80	0.80	1.84	3.79	3.79
50th-Percentile Queue Length [ft/ln]	74.15	16.79	6.94	270.11	20.04	46.09	94.82	94.79
95th-Percentile Queue Length [veh/ln]	5.34	1.21	0.50	16.20	1.44	3.32	6.83	6.82
95th-Percentile Queue Length [ft/ln]	133.47	30.22	12.48	404.88	36.07	82.96	170.67	170.61

Movement, Approach, & Intersection Results

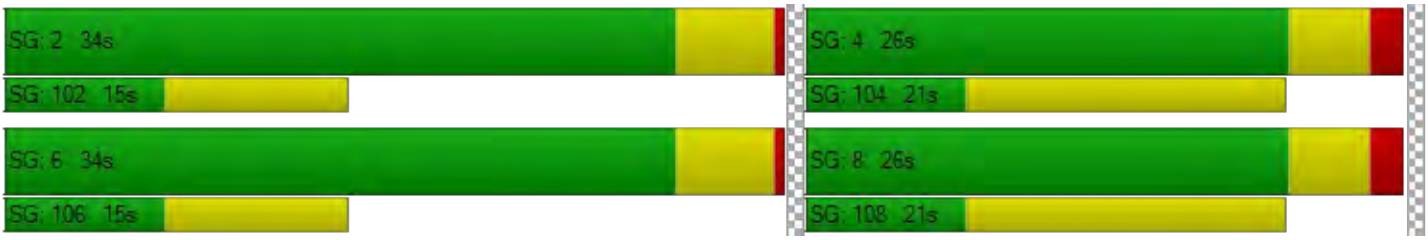
d_M, Delay for Movement [s/veh]	23.63	23.63	23.63	20.14	20.14	20.14	12.30	18.69	4.87	39.04	7.86	7.86
Movement LOS	C	C	C	C	C	C	B	B	A	D	A	A
d_A, Approach Delay [s/veh]	23.63			20.14			16.46			9.92		
Approach LOS	C			C			B			A		
d_I, Intersection Delay [s/veh]	13.98											
Intersection LOS	B											
Intersection V/C	0.829											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersection	2.079	1.780	3.022	2.766
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	703	703	977	977
d_b, Bicycle Delay [s]	12.61	12.62	7.86	7.87
I_b,int, Bicycle LOS Score for Intersection	1.941	1.659	3.677	2.733
Bicycle LOS	A	A	D	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Curson Ave/6th St

Control Type:	Signalized	Delay (sec / veh):	14.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.539

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	40.00	100.00	100.00	100.00	100.00	40.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			W 6th Street			W 6th Street		
Base Volume Input [veh/h]	263	49	262	53	60	35	43	470	168	100	563	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	263	49	262	53	60	35	43	470	168	100	563	61
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	13	67	14	15	9	11	120	43	26	144	16
Total Analysis Volume [veh/h]	268	50	267	54	61	36	44	480	171	102	574	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			14			15			13		
v_di, Inbound Pedestrian Volume crossing m	13			15			14			12		
v_co, Outbound Pedestrian Volume crossing	29			17			28			17		
v_ci, Inbound Pedestrian Volume crossing mi	28			17			29			17		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			1			1			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	31.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	10	0	0	10	0
Maximum Green [s]	0	20	0	0	20	0	0	30	0	0	30	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	5.1	0.0	0.0	5.6	0.0
Walk [s]	0	9	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	16	0	0	12	0	0	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	20	20	20	20	30	30	30	30	30	30
g / C, Green / Cycle	0.33	0.33	0.33	0.33	0.49	0.49	0.49	0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.05	0.06	0.06	0.26	0.12	0.13	0.17	0.18
s, saturation flow rate [veh/h]	1272	1543	1045	1727	785	1870	1467	773	1870	1783
c, Capacity [veh/h]	448	515	250	576	399	922	723	344	922	879
d1, Uniform Delay [s]	20.94	16.77	24.26	14.12	13.20	10.37	8.64	17.47	9.32	9.35
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.28	1.20	0.43	0.14	0.56	2.10	0.77	2.20	1.05	1.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.62	0.22	0.17	0.11	0.52	0.24	0.30	0.35	0.36
d, Delay for Lane Group [s/veh]	22.22	17.97	24.69	14.25	13.75	12.47	9.41	19.66	10.37	10.48
Lane Group LOS	C	B	C	B	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	3.38	3.45	0.70	0.87	0.43	4.14	1.22	1.26	2.45	2.39
50th-Percentile Queue Length [ft/ln]	84.46	86.25	17.41	21.66	10.71	103.38	30.55	31.59	61.13	59.73
95th-Percentile Queue Length [veh/ln]	6.08	6.21	1.25	1.56	0.77	7.44	2.20	2.27	4.40	4.30
95th-Percentile Queue Length [ft/ln]	152.03	155.25	31.34	38.98	19.27	186.09	54.99	56.87	110.04	107.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.22	17.97	17.97	24.69	14.25	14.25	13.75	12.47	9.41	19.66	10.42	10.48
Movement LOS	C	B	B	C	B	B	B	B	A	B	B	B
d_A, Approach Delay [s/veh]	19.92			17.99			11.80			11.70		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.39											
Intersection LOS	B											
Intersection V/C	0.539											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	18.41
I_p,int, Pedestrian LOS Score for Intersection	2.361	2.080	2.965	2.557
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	753	753	900	900
d_b, Bicycle Delay [s]	11.67	11.66	9.08	9.09
I_b,int, Bicycle LOS Score for Intersection	2.525	1.809	2.706	2.168
Bicycle LOS	B	A	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Ogden Dr/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	3.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.381

Intersection Setup

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	1	1	0
Entry Pocket Length [ft]	100.00	70.00	100.00	90.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	S Ogden Drive		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	8	43	1030	27	2	963
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	43	1030	27	2	963
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	12	283	7	1	265
Total Analysis Volume [veh/h]	9	47	1132	30	2	1058
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		46		0	
v_di, Inbound Pedestrian Volume crossing m	0		45		0	
v_co, Outbound Pedestrian Volume crossing	52		51		45	
v_ci, Inbound Pedestrian Volume crossing mi	51		52		46	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		1		4	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.3	0.0	1.0	0.0	0.0	1.0
Split [s]	44	0	46	0	0	46
Vehicle Extension [s]	3.0	0.0	4.1	0.0	0.0	5.2
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	24	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.1	0.0	0.0	3.1
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.90	5.10	5.10	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.90	3.90	3.10	3.10	3.10	3.10
g_i, Effective Green Time [s]	7	7	72	72	72	72
g / C, Green / Cycle	0.08	0.08	0.80	0.80	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.32	0.02	0.00	0.30
s, saturation flow rate [veh/h]	1226	1589	3560	1457	481	3560
c, Capacity [veh/h]	94	121	2854	1168	406	2854
d1, Uniform Delay [s]	38.67	39.55	2.60	1.81	4.71	2.52
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.44	2.02	0.41	0.04	0.02	0.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	0.39	0.40	0.03	0.00	0.37
d, Delay for Lane Group [s/veh]	39.11	41.57	3.01	1.85	4.73	2.89
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.19	1.05	1.88	0.08	0.01	1.70
50th-Percentile Queue Length [ft/ln]	4.87	26.17	46.97	1.91	0.32	42.55
95th-Percentile Queue Length [veh/ln]	0.35	1.88	3.38	0.14	0.02	3.06
95th-Percentile Queue Length [ft/ln]	8.77	47.11	84.54	3.44	0.58	76.60

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.11	41.57	3.01	1.85	4.73	2.89
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	41.17		2.98		2.90	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	3.88					
Intersection LOS	A					
Intersection V/C	0.381					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	125.68	0.00
d_p, Pedestrian Delay [s]	34.66	34.66	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.971	2.734	0.000
Crosswalk LOS	A	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	847	909	909
d_b, Bicycle Delay [s]	14.96	13.39	13.41
I_b,int, Bicycle LOS Score for Intersection	1.560	2.518	2.434
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: Spaulding Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	8.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.436

Intersection Setup

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	70.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	S Spaulding Avenue		Wilshire Boulevard		Wilshire Boulevard	
Base Volume Input [veh/h]	45	64	971	95	49	907
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	64	971	95	49	907
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	17	264	26	13	246
Total Analysis Volume [veh/h]	49	70	1055	103	53	986
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	23		22		24	
v_di, Inbound Pedestrian Volume crossing m	24		22		23	
v_co, Outbound Pedestrian Volume crossing	48		48		22	
v_ci, Inbound Pedestrian Volume crossing mi	48		48		22	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		1		5	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	8	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	9	0	10	0	0	10
Maximum Green [s]	30	0	40	0	0	40
Amber [s]	3.6	0.0	4.1	0.0	0.0	4.1
All red [s]	2.0	0.0	0.7	0.0	0.0	0.7
Split [s]	40	0	50	0	0	50
Vehicle Extension [s]	4.9	0.0	4.4	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	22	0	8	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.6	0.0	2.8	0.0	0.0	2.8
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		Yes			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	20.0	0.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	L	C
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	4.80	4.80	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.60	2.80	2.80	2.80	2.80
g_i, Effective Green Time [s]	18	62	62	62	62
g / C, Green / Cycle	0.20	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.07	0.31	0.33	0.11	0.28
s, saturation flow rate [veh/h]	1663	1870	1778	485	3560
c, Capacity [veh/h]	330	1283	1220	324	2443
d1, Uniform Delay [s]	31.14	6.41	6.57	12.47	6.12
k, delay calibration	0.22	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.36	1.15	1.33	1.08	0.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.45	0.47	0.16	0.40
d, Delay for Lane Group [s/veh]	32.49	7.56	7.89	13.55	6.62
Lane Group LOS	C	A	A	B	A
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.32	4.56	4.70	0.66	3.54
50th-Percentile Queue Length [ft/ln]	58.10	113.94	117.40	16.60	88.53
95th-Percentile Queue Length [veh/ln]	4.18	8.06	8.25	1.20	6.37
95th-Percentile Queue Length [ft/ln]	104.58	201.46	206.25	29.88	159.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.49	32.49	7.71	7.89	13.55	6.62
Movement LOS	C	C	A	A	B	A
d_A, Approach Delay [s/veh]	32.49		7.73		6.98	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	8.66					
Intersection LOS	A					
Intersection V/C	0.436					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	34.65	34.65
I_p,int, Pedestrian LOS Score for Intersection	1.924	2.665	2.804
Crosswalk LOS	A	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	765	1005	1005
d_b, Bicycle Delay [s]	17.18	11.14	11.16
I_b,int, Bicycle LOS Score for Intersection	1.756	2.515	2.417
Bicycle LOS	A	B	B

Sequence

Ring 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Curson Ave/Wilshire Blvd

Control Type:	Signalized	Delay (sec / veh):	226.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.292

Intersection Setup

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	110.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S Curson Avenue			S Curson Avenue			Wilshire Boulevard			Wilshire Boulevard		
Base Volume Input [veh/h]	238	614	232	163	197	178	146	859	27	35	525	84
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	11
Total Hourly Volume [veh/h]	238	614	232	163	197	178	146	859	27	35	525	73
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	165	62	44	53	48	39	231	7	9	141	20
Total Analysis Volume [veh/h]	256	660	249	175	212	191	157	924	29	38	565	78
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			53			53			21		
v_di, Inbound Pedestrian Volume crossing m	21			53			53			20		
v_co, Outbound Pedestrian Volume crossing	36			51			36			50		
v_ci, Inbound Pedestrian Volume crossing mi	36			50			36			51		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			3			3			6		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	8	0	0	8	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	40	0	0	40	0
Amber [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.0	0.0	4.1	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0
Split [s]	0	40	0	0	40	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.1	0.0	0.0	4.7	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.6	0.0	0.0	3.6	0.0	0.0	2.9	0.0	0.0	2.9	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			Yes			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.60	5.60	4.90	4.90	4.90	4.90	4.90	4.90
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.60	3.60	2.90	2.90	2.90	2.90	2.90	2.90
g_i, Effective Green Time [s]	34	34	45	45	45	45	45	45
g / C, Green / Cycle	0.38	0.38	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.92	0.57	0.20	0.26	0.26	0.06	0.16	0.06
s, saturation flow rate [veh/h]	1268	1011	776	1870	1837	589	3560	1394
c, Capacity [veh/h]	533	438	377	937	920	259	1784	699
d1, Uniform Delay [s]	29.30	29.19	21.41	15.01	15.05	23.20	13.27	11.74
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	539.55	158.54	3.36	1.99	2.06	1.19	0.47	0.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	2.19	1.32	0.42	0.51	0.52	0.15	0.32	0.11
d, Delay for Lane Group [s/veh]	568.84	187.73	24.77	17.00	17.11	24.39	13.74	12.07
Lane Group LOS	F	F	C	B	B	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	91.45	28.99	2.81	6.68	6.64	0.67	3.33	0.85
50th-Percentile Queue Length [ft/ln]	2286.27	724.74	70.36	167.00	165.97	16.83	83.22	21.19
95th-Percentile Queue Length [veh/ln]	147.91	44.53	5.07	10.92	10.86	1.21	5.99	1.53
95th-Percentile Queue Length [ft/ln]	3697.77	1113.30	126.65	272.97	271.62	30.30	149.79	38.14

Movement, Approach, & Intersection Results

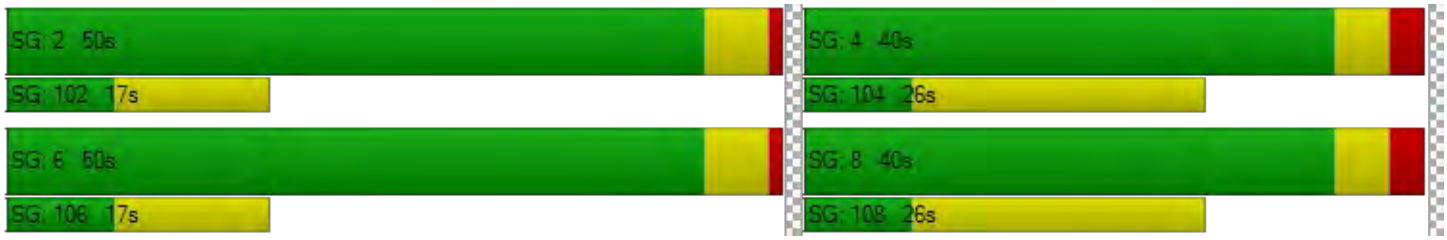
d_M, Delay for Movement [s/veh]	568.84	568.84	568.84	187.73	187.73	187.73	24.77	17.05	17.11	24.39	13.74	12.07
Movement LOS	F	F	F	F	F	F	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	568.84			187.73			18.15			14.14		
Approach LOS	F			F			B			B		
d_I, Intersection Delay [s/veh]	226.65											
Intersection LOS	F											
Intersection V/C	1.292											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.60	34.60	34.60	34.60
I_p,int, Pedestrian LOS Score for Intersection	2.472	2.661	3.077	3.048
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	766	1004	1004
d_b, Bicycle Delay [s]	17.14	17.14	11.16	11.18
I_b,int, Bicycle LOS Score for Intersection	3.482	2.513	2.475	2.131
Bicycle LOS	C	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX K

Service Request Correspondence Letters

Los Angeles Department of Water & Power

BUILDING A STRONGER L.A.

Eric Garcetti, Mayor

Board of Commissioners
Cynthia McClain-Hill, President
Cynthia M. Ruiz, Vice President
Mia Lehrer
Nicole Neeman Brady
Chante L. Mitchell, Secretary

Martin L. Adams, General Manager and Chief Engineer

October 28, 2022

Mr. Jesse Rocha
Natural History Museums of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

Dear Mr. Rocha:

Subject: Los Angeles Department of Water and Power
Water and Electricity Connection Services Request
La Brea Tar Pits Master Plan Project

The Los Angeles Department of Water and Power (LADWP) is in receipt of your letter dated September 30, 2022, requesting LADWP's ability to provide water and electric services for the La Brea Tar Pits Master Plan Project (Project). Below your request has been broken out into separate questions for Water and Power to ensure a thorough response. LADWP's response to each question is in bold.

Project Description:

The La Brea Tar Pits property is located at 5801 Wilshire Boulevard within the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902)
(Thomas Brothers Map: 633-C2).

The Project site includes 13 acres of the eastern and northwestern portions of Hancock Park, as shown on Figure 1 (enclosed). The Project would result in a reimagined site design, expansion, and upgrades for the La Brea Tar Pits complex and portions of Hancock Park, including renovations to the George C. Page Museum (Page Museum).

Construct a new two-story 40,000 gross-square-foot (gsf) museum building northwest of the Page Museum including two new theaters. Renovate existing building in same footprint (approximately 63,200 sf). Demolish existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. Construct new 2,000 gsf satellite maintenance and support building.

As shown on Figure 2 (enclosed) the Project would require installing a new three-inch water line and a new three-inch fire line at the northeast comer of the site beneath the parking lot, which would connect to the existing water meter in the sidewalk on South Curson Avenue. New above grade backflow preventer devices would be located just inside the property line adjacent to the meter. Due to the high corrosivity of the on-site soils, the piping infrastructure has deteriorated and appears to be near the end of its service life. All existing site water piping would be replaced. To prevent future corrosion of the pipe material, new pipes would be polyvinyl chloride (PVC) C-900 material and metal fittings would be wrapped and protected from contact with soil material according to geotechnical recommendations. Lastly, water service to both the Observation Pit, as well as, Project 23 currently is provided by the Los Angeles County Museum of Arts (LACMA). Due to the relatively remote location of these service points compared to their proximity to LACMA it is practical to assume that those demands would continue to be served by and coordinated with LACMA.

We are providing information for consideration and incorporation into the planning, design, and development efforts for the proposed Project. Regarding water needs for the proposed Project, this letter does not constitute a response to a Water Supply Assessment (WSA) pursuant to California State Water Code Sections 10910-10915 for development projects to determine the availability of long-term water supply. Depending on the Project scope, a WSA by the water supply agency may need to be requested by the California Environmental Quality Act Lead Agency and completed prior to issuing a draft Negative Declaration or draft Environmental Impact Report.

If a Lead Agency determines that the proposed Project parameters (e.g., development details such as type, square footage, anticipated water demand, population increase, etc.) are such that they are subject to state law requiring a WSA, a separate request must be made in writing and sent to:

Mr. Anselmo G. Collins
Senior Assistant General Manager – Water System
Los Angeles Department of Water and Power
111 North Hope Street, Room 1455
Los Angeles, CA 90012

If you have any further questions regarding the water supply assessment process, please contact Mr. Delon Kwan, at (213) 367-2166 or via email at Delon.Kwan@ladwp.com.

Water Needs

As the Project proceeds further in the design phase, we recommend the Project applicant or designated Project Management Engineer contact Mr. Hugo Torres, at (213) 367-2130 or via email at Hugo.Torres@ladwp.com to make arrangements for water supply service needs.

The following responses are provided regarding impacts to water service.

1) Please describe sizes and capacities of existing water mains that would serve the Project Site.

a) The project site is served by eight-inch AC pipe Wilshire Blvd, eight-inch AC pipe Curson Avenue and eight-inch CI pipe on 6th Street as shown on the enclosed water service maps 134-177, 134-180, 136-177, 136-180.

2) Are there any existing water service problems/deficiencies in the Project area?

a) There are no known water service problems/deficiencies.

3) Would LADWP be able to accommodate the Project's demand for water service with the existing infrastructure in the Project area? If not, what new infrastructure or upgrades to infrastructure would be needed?

a) LADWP should be able to provide the domestic needs of the project from the existing water system. LADWP cannot determine the impact on the existing water system until the fire demands of the project are known. Once a determination of the fire demands has been made, LADWP will assess the need for additional facilities, if needed.

4) Does LADWP have sufficient capacity to support the Project's water demand?

a) LADWP works closely with the City of Los Angeles, Department of City Planning to develop and update our Urban Water Management Plan (UWMP) every five years. The UWMP is the planning document for future water demands for the City. The UWMP identifies short-term and long-term water resources management measures to meet growing water demands during normal, single-dry, and multiple-dry years over a 25-year horizon. The City's water demand projection in the UWMP was developed based on the Regional Transportation Plan (RTP) demographic projection by the Southern California Association of Governments (SCAG).

b) See the following link to the 2020 UWMP: http://www.ladwp.com/uwmp

c) In general, projects that conform to the demographic projection from the RTP by SCAG and are currently located in the City's service area are considered to have been included in LADWP's water supply planning efforts; therefore, the projected water supplies would meet projected demands.

Power Needs

It should be noted that the Project Applicant may be financially responsible for some of infrastructure improvements (e.g., installation of electric power facilities or service connections) necessary to serve the proposed Project.

As the Project proceeds further, please contact one of our Engineering Offices, as listed on Pages 1-4 of the Electric Service Requirements (available on-line at www.ladwp.com) for dealing with power services and infrastructure needs.

1) Please describe the sizes and voltages of existing electrical distribution lines and facilities that would serve the project site and the surrounding area.

a) There are three underground 4.8KV circuits in proximity of project site which one runs along West Wilshire Boulevard, second one runs along South Spaulding Avenue and third one runs along West Wilshire Boulevard and South Ogden Drive.

b) There are three underground 34.5KV circuits adjacent to project site which run along West Wilshire Boulevard.

LADWP does not release/provide electrical distribution maps.

2) Would LADWP be able to accommodate the proposed Project's demand for electricity service with the existing infrastructure in the Project area? If not, what new infrastructure would be needed to meet the proposed Project's demand for electricity?

a) This cannot be answered without review of the Project developer's electrical drawings and load schedules. However, the cumulative effects of this and other Projects in the area will require the LADWP to construct additional distribution facilities in the future. This Project will require on-site transformation and may require underground line extension on public streets.

3) Would LADWP be able to accommodate the proposed Project's demand for electricity with existing electricity supplies?

a) Electric Service is available and will be provided in accordance with the LADWP's Rules Governing Water and Electric Service (available on-line at https://www.ladwp.com under Commercial/Customer Service/Electric Services/Codes and Specifications). The availability of electricity is dependent upon adequate generating capacity and adequate fuel supplies. The estimated power requirement for this proposed Project is part of the total load growth forecast for the City of Los Angeles and has been taken-into account in the planned growth of the City's power system.

b) LADWP's load growth forecast incorporates construction activity and is built into the commercial floor space model; the McGraw Hill Construction report identifies all large projects. In planning sufficient future resources, LADWP's Power Integrated Resource Plan incorporates the estimated power requirement for the proposed Project through the load forecast input and has planned sufficient resources to supply the electricity needs.

Water Conservation

LADWP is always looking for means to assist its customers to use water resources more efficiently and welcomes the opportunity to work with new developments to identify water conservation opportunities. Some water conservation measures are enclosed. The LADWP website contains a current list of the available rebates and incentive programs, including the performance based Custom Water Conservation Technical Assistance Program (WCTAP, https://www.ladwp.com/ladwp/faces/wcnav_externalId/a-w-cstm-wtr-prjct-tap?_adf.ctrl-state=h8fsat92s_4&_afrLoop=3392823718109) for commercial, industrial, institutional and multi-family residential customers up to $250,000 for the installation of pre-approved equipment which demonstrates water savings. Mr. Mark Gentili is the Water Conservation Program Manager and can be reached, at (213) 367-8556 or via email, at Mark.Gentili@ladwp.com. See the following link for LADWP water conservation rebate information on our website: https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-water/a-w-conservation

Energy Efficiency

LADWP suggests consideration and incorporation of energy- efficient design measures (enclosed) for building new commercial and/or remodeling existing facilities. Implementation of applicable measures would exceed Title 24 energy efficiency requirements. LADWP continues to offer a number of energy efficiency programs to reduce peak electrical demand and energy costs. For further information please contact Ms. Lucia Alvelais, Utility Services Manager, at (213) 367-4939 or via email at Lucia.Alvelais@ladwp.com. See the following link for LADWP energy efficiency rebate information on our website: https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-energyefficiencyandrebates

Solar Energy

Solar power is a renewable, nonpolluting energy source that can help reduce our dependence on fossil fuels. Mr. Arash Saidi is the Solar Energy Program Manager and can be reached, at (213) 367-4886 or via email at Arash.Saidi@ladwp.com.

For more information about the Solar Programs, please visit the LADWP website: www.ladwp.com/solar or www.ladwp.com/fit regarding the Feed-In Tariff Program. To begin the process of integrating a net-metered solar system, please visit this website: www.ladwp.com/NEM.

For more information on other rebates and programs, please visit the LADWP website:https://www.ladwp.com/ladwp/faces/ladwp/commercial/c-savemoney/c-sm-rebatesandprograms

Electric Vehicle Transportation

LADWP is encouraging the installation of convenient electric vehicle (EV) charging stations for the home, workplace, and public charging to support the adoption of EVs in the City. Mr. Yamen Nanne is the Electric Vehicle Program Manager and can be reached, at (213) 367-2585 or via email at Yamen.Nanne@ladwp.com.

For more information on LADWP EV discount rates and charging incentives for residential and business customers, please visit the website: www.ladwp.com/ev. If you would like a Customer Service Representative to answer your questions or review your account and help you decide on the best option, please call us at 1 (866) 484-0433 or email us at PluginLA@ladwp.com.

Please include LADWP in your mailing list and address it to the attention of Mr. Charles C. Holloway for review of the environmental document for the proposed Project.

Mr. Charles C. Holloway
Manager of Environmental Planning and Assessment
Los Angeles Department of Water and Power
111 North Hope Street, Room 1044
Los Angeles, CA 90012

If there are any additional questions on this utility services request, please contact Mr. Marshall Styers, of the Environmental Assessment Group, at (213) 367-3541.

Sincerely,

Charles C. Holloway
Manager of Environmental Planning and Assessment

MS:gn
Enclosures
c/enc: Mr. Anselmo G. Collins
Mr. Delon Kwan
Mr. Hugo Torres
Mr. Mark Gentili
Ms. Lucia Alvelais
Mr. Arash Saidi
Mr. Yamen Nanne
Mr. Peter Liang
Ms. Selamawit Azage
Mr. Nathanial Hermosura Bautista
Mr. Marshall Styers

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TIMEYIN DAFETA
HYPERION EXECUTIVE PLANT MANAGER

WASTEWATER ENGINEERING
SERVICES DIVISION
2714 MEDIA CENTER DRIVE
LOS ANGELES, CA 90065
FAX: (323) 342-6210
WWW.LACITYSAN.ORG

November 22, 2022

Mr. Richard Hayden, Assistant Deputy Director
Natural History Museums of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

Dear Mr. Hayden,

LA BREA TAR PITS MASTER PLAN PROJECT - REQUEST FOR WASTEWATER SERVICE INFORMATION

This is in response to your September 30, 2022 letter requesting a review of your proposed museum building project located at 5801 Wilshire Boulevard, Los Angeles, CA 90036. The project will consist of a new two story museum with two new theaters. LA Sanitation has conducted a preliminary evaluation of the potential impacts to the wastewater and stormwater systems for the proposed project.

WASTEWATER REQUIREMENT

LA Sanitation, Wastewater Engineering Services Division (WESD) is charged with the task of evaluating the local sewer conditions and to determine if available wastewater capacity exists for future developments. The evaluation will determine cumulative sewer impacts and guide the planning process for any future sewer improvement projects needed to provide future capacity as the City grows and develops.

Projected Wastewater Discharges for the Proposed Project:

Type Description	Average Daily Flow per Type Description (GPD/UNIT)	Proposed No. of Units	Average Daily Flow (GPD)
Proposed			
Museum Building	30 GPD/1000 SQ.FT	42,000 SQ.FT	1,260
Lobby	50 GPD/1000 SQ.FT	4,000 SQ.FT	200
Exhibit Spaces	50 GPD/1000 SQ.FT	24,000 SQ.FT	1,200
Theater #1	3 GPD/ 1 Seat	70 Seats	210
Theater #2	3 GPD/ 1 Seat	190 Seats	570
Research Room	50 GPD/1000 SQ.FT	21,030 SQ.FT	1,052
Administration Space	120 GPD/1000 SQ.F	11,090 SQ.FT	1,331
Total			**5,823 GPD**

SEWER AVAILABILITY

The sewer infrastructure in the vicinity of the proposed project includes an existing 12-inch line on Curson Ave. The sewage from the existing 12-inch line feeds into an 18-inch line on Wilshire Blvd then into a 39-inch line on Crescent Heights Blvd before discharging into a 48-inch sewer line on Crescent Heights Blvd. Figure 1 shows the details of the sewer system within the vicinity of the project. The current flow level (d/D) in the 12-inch line cannot be determined at this time without additional gauging.

The current approximate flow level (d/D) and the design capacities at d/D of 50% in the sewer system are as follows:

Pipe Diameter (in)	Pipe Location	Current Gauging d/D (%)	50% Design Capacity
12	Curson Ave.	*	478,089 GPD
18	Wilshire Blvd.	16	4.13 MGD
18	Wilshire Blvd.	18	4.18 MGD
21	Alley E/O Hayworth Ave.	46	3.01 MGD
21	Crescent Heights Blvd.	36	2.85 MGD
21	Crescent Heights Blvd.	48	2.85 MGD
39	Crescent Heights Blvd.	30	16.43 MGD
39	Crescent Heights Blvd.	51	16.43 MGD
39	Crescent Heights Blvd.	35	16.43 MGD
39	Crescent Heights Blvd.	51	16.43 MGD
48	Crescent Heights Blvd.	31	28.91 MGD

* No gauging available

Based on estimated flows, it appears the sewer system might be able to accommodate the total flow for your proposed project. Further detailed gauging and evaluation will be needed as part of the permit process to identify a specific sewer connection point. If the public sewer lacks sufficient capacity, then the developer will be required to build sewer lines to a point in the sewer system with sufficient capacity. A final approval for sewer capacity and connection permit will be made at the time. Ultimately, this sewage flow will be conveyed to the Hyperion Water Reclamation Plant, which has sufficient capacity for the project.

All sanitary wastewater ejectors and fire tank overflow ejectors shall be designed, operated, and maintained as separate systems. All sanitary wastewater ejectors with ejection rates greater than 30

GPM shall be reviewed and must be approved by LASAN WESD staff prior to other City plan check approvals. Lateral connection of development shall adhere to Bureau of Engineering Sewer Design Manual Section F 480.

If you have any questions, please call Christopher DeMonbrun at (323) 342-1567 or email at chris.demonbrun@lacity.org.

STORMWATER REQUIREMENTS

LA Sanitation, Stormwater Program is charged with the task of ensuring the implementation of the Municipal Stormwater Permit requirements within the City of Los Angeles. We anticipate the following requirements would apply for this project.

POST-CONSTRUCTION MITIGATION REQUIREMENTS

In accordance with the Municipal Separate Storm Sewer (MS4) National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R4-2012-0175, NPDES No. CAS004001) and the City of Los Angeles Stormwater and Urban Runoff Pollution Control requirements (Chapter VI, Article 4.4, of the Los Angeles Municipal Code), the Project shall comply with all mandatory provisions to the Stormwater Pollution Control Measures for Development Planning (also known as Low Impact Development [LID] Ordinance). Prior to issuance of grading or building permits, the applicant shall submit a LID Plan to the City of Los Angeles, Public Works, LA Sanitation, Stormwater Program for review and approval. The LID Plan shall be prepared consistent with the requirements of the Planning and Land Development Handbook for Low Impact Development.

Current regulations prioritize infiltration, capture/use, and then biofiltration as the preferred stormwater control measures. The relevant documents can be found at: www.lacitysan.org. It is advised that input regarding LID requirements be received in the preliminary design phases of the project from plan-checking staff. Additional information regarding LID requirements can be found at: www.lacitysan.org or by visiting the stormwater public counter at 201 N. Figueroa, 2nd Fl, Suite 280.

GREEN STREETS

The City is developing a Green Street Initiative that will require projects to implement Green Street elements in the parkway areas between the roadway and sidewalk of the public right-of-way to capture and retain stormwater and urban runoff to mitigate the impact of stormwater runoff and other environmental concerns. The goals of the Green Street elements are to improve the water quality of stormwater runoff, recharge local groundwater basins, improve air quality, reduce the heat island effect of street pavement, enhance pedestrian use of sidewalks, and encourage alternate means of transportation. The Green Street elements may include infiltration systems, biofiltration swales, and permeable pavements where stormwater can be easily directed from the streets into the parkways and can be implemented in conjunction with the LID requirements. Green Street standard plans can be found at: https://eng2.lacity.org/techdocs/stdplans/index.htm

CONSTRUCTION REQUIREMENTS

All construction sites are required to implement a minimum set of BMPs for erosion control, sediment control, non-stormwater management, and waste management. In addition, construction sites with active grading permits are required to prepare and implement a Wet Weather Erosion Control Plan during the rainy season between October 1 and April 15. Construction sites that disturb

more than one-acre of land are subject to the NPDES Construction General Permit issued by the State of California, and are required to prepare, submit, and implement the Storm Water Pollution Prevention Plan (SWPPP).

If there are questions regarding the stormwater requirements, please call WPP's plan-checking counter at (213) 482-7066. WPD's plan-checking counter can also be visited at 201 N. Figueroa, 2nd Fl, Suite 280.

GROUNDWATER DEWATERING REUSE OPTIONS

The Los Angeles Department of Water and Power (LADWP) is charged with the task of supplying water and power to the residents and businesses in the City of Los Angeles. One of the sources of water includes groundwater. The majority of groundwater in the City of Los Angeles is adjudicated, and the rights of which are owned and managed by various parties. Extraction of groundwater within the City from any depth by law requires metering and regular reporting to the appropriate Court-appointed Watermaster. LADWP facilitates this reporting process, and may assess and collect associated fees for the usage of the City's water rights. The party performing the dewatering should inform the property owners about the reporting requirement and associated usage fees.

On April 22, 2016 the City of Los Angeles Council passed Ordinance 184248 amending the City of Los Angeles Building Code, requiring developers to consider beneficial reuse of groundwater as a conservation measure and alternative to the common practice of discharging groundwater to the storm drain (SEC. 99.04.305.4). It reads as follows: "Where groundwater is being extracted and discharged, a system for onsite reuse of the groundwater, shall be developed and constructed. Alternatively, the groundwater may be discharged to the sewer."

Groundwater may be beneficially used as landscape irrigation, cooling tower make-up, and construction (dust control, concrete mixing, soil compaction, etc.). Different applications may require various levels of treatment ranging from chemical additives to filtration systems. When onsite reuse is not available the groundwater may be discharged to the sewer system. This allows the water to be potentially reused as recycled water once it has been treated at a water reclamation plant. If groundwater is discharged into the storm drain it offers no potential for reuse. The onsite beneficial reuse of groundwater can reduce or eliminate costs associated with sewer and storm drain permitting and monitoring. Opting for onsite reuse or discharge to the sewer system are the preferred methods for disposing of groundwater.

To help offset costs of water conservation and reuse systems, LADWP offers a Technical Assistance Program (TAP), which provides engineering and technical assistance for qualified projects. Financial incentives are also available. Currently, LADWP provides an incentive of $1.75 for every 1,000 gallons of water saved during the first two years of a five-year conservation project. Conservation projects that last 10 years are eligible to receive the incentive during the first four years. Other water conservation assistance programs may be available from the Metropolitan Water District of Southern California. To learn more about available water conservation assistance programs, please contact LADWP Rebate Programs 1-888-376-3314 and LADWP TAP 1-800-544-4498, selection "3".

For more information related to beneficial reuse of groundwater, please contact Greg Reed, Manager of Water Rights and Groundwater Management, at (213)367-2117 or greg.reed@ladwp.com.

SOLID RESOURCE REQUIREMENTS

The City has a standard requirement that applies to all proposed residential developments of four or more units or where the addition of floor areas is 25 percent or more, and all other development projects where the addition of floor area is 30 percent or more. Such developments must set aside a recycling area or room for onsite recycling activities. For more details of this requirement, please contact LA Sanitation Solid Resources Recycling hotline 213-922-8300.

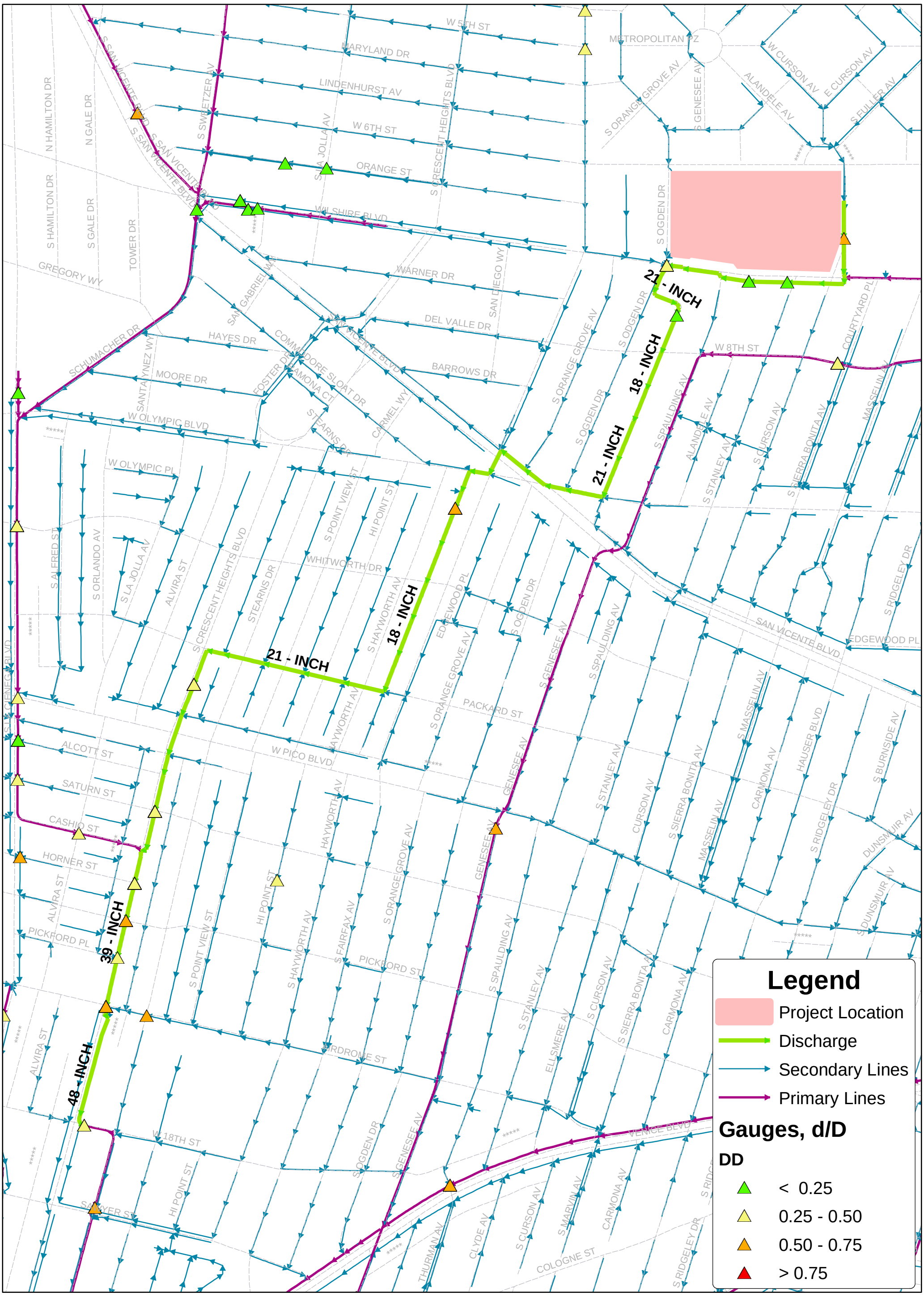
Sincerely,

Rowena Lau, Division Manager
Wastewater Engineering Services Division
LA Sanitation and Environment

RL/CD: sa

Attachment: Figure 1 - Sewer Map

c: Julie Allen, LASAN
Michael Scaduto, LASAN
Christine Sotelo, LASAN
Christopher DeMonbrun, LASAN



Wastewater Engineering Services Division
Bureau of Sanitation
City of Los Angeles

Figure 1
La Brea Tar Pits Master Plan
Sewer Map

N
W E
S

0 250 500 1,000 1,500 2,000
Feet

Thomas Brother Data reproduced with permission granted by THOMAS BROS MAP

APPENDIX L

Energy Analysis Report

Energy Analysis Report
La Brea Tar Pits Master Plan
Los Angeles, California

OCTOBER 2022

PREPARED FOR

Los Angeles County Museum of Natural History Foundation

LEAD AGENCY

County of Los Angeles

PREPARED BY

SWCA Environmental Consultants

SWCA

ENERGY ANALYSIS REPORT
LA BREA TAR PITS MASTER PLAN
LOS ANGELES, CALIFORNIA

Prepared for

Natural History Museums of Los Angeles County
900 Exposition Boulevard
Los Angeles, California 90007
Attn: Dawn McDivitt, Chief Deputy Director

Prepared by

Brad Sohm, Principal Air Quality Team Lead
Erin Wielenga, Air Quality Specialist

SWCA Environmental Consultants
320 North Halstead Street, Suite 120
Pasadena, California 91107
(626) 240-0587
www.swca.com

SWCA Project No. 63953

October 2022

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Appendix

Appendix A. Fuel Usage and Energy Calculations

1 INTRODUCTION

The 13-acre La Brea Tar Pits site is located within the eastern and northeastern portions of Hancock Park in Los Angeles, California. The La Brea Tar Pits, the George C. Page Museum (Page Museum), and associated facilities, are owned by the County of Los Angeles (County) but are managed by the non-profit Los Angeles County Museum of Natural History Foundation (Foundation). The Foundation's role is to carry out all County services including public access and programming, administration, and operation of the Natural History Museums of Los Angeles County (NHMLAC), including the La Brea Tar Pits and Page Museum. The Foundation and NHMLAC propose a redevelopment, or "reimagining," of the La Brea Tar Pits site, including renovation of the Page Museum, constructing a new museum building, and developing new amenities in surrounding portions of Hancock Park.

The County is the Lead Agency under the California Environmental Quality Act (CEQA); NHMLAC is a County departmental unit. The NHMLAC retained SWCA Environmental Consultants (SWCA) to prepare an Energy Analysis Report in support of the proposed La Brea Tar Pits Master Plan (project).

This energy analysis has been prepared in accordance with CEQA and Public Resources Code (PRC) 21100(b)(3). This assessment examines the amount of energy expected to be consumed during the construction and operation of the project. This impact analysis evaluates the potential for the project to result in the wasteful use of energy or wasteful use of energy resources during project construction and operation, consistent with PRC 21100(b)(3) and Section 15126.2(b) and Appendices F and G of the State CEQA Guidelines. The analysis provides construction and operational energy use estimates for the project. This information is then used to evaluate whether this energy use would be considered wasteful, inefficient, or unnecessary, taking into account available energy supplies and existing use patterns, the project's energy efficiency features, and compliance with applicable standards and policies aimed to reduce energy consumption, including California's Title 24 Energy Efficiency Standards.

2 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The La Brea Tar Pits property (project site) is located at 5801 Wilshire Boulevard within the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902) (Figures 1 and 2). The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and is directly adjacent to the Los Angeles County Museum of Art (LACMA). The project site is located approximately 5.5 miles west from downtown Los Angeles and approximately 8.6 miles east of the Pacific Ocean. It is bounded by West 6th Street to the north (an approximately 1,200-foot-long frontage), South Curson Avenue to the east (an approximately 830-foot-long frontage), Wilshire Boulevard to the south (an approximately 500-foot-long frontage), and the LACMA to the west (an approximately 250-foot-long frontage). The area is known as the Miracle Mile neighborhood of the city of Los Angeles. The project site can be found on the U.S. Geological Survey (USGS) Hollywood, California 7.5-minute quadrangle in Section 20, Township 1 South, Range 14 West.

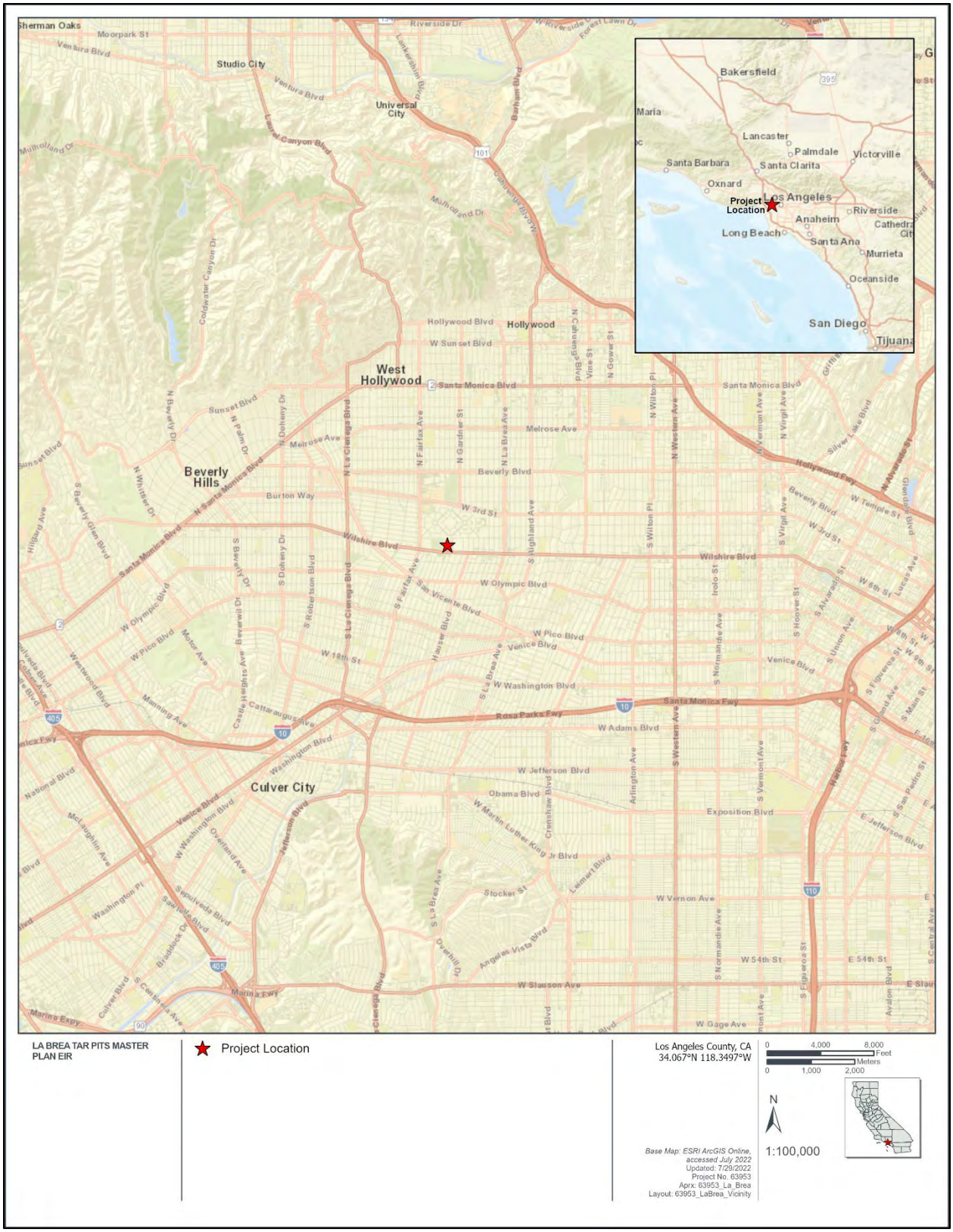

Figure 1. Project vicinity map.

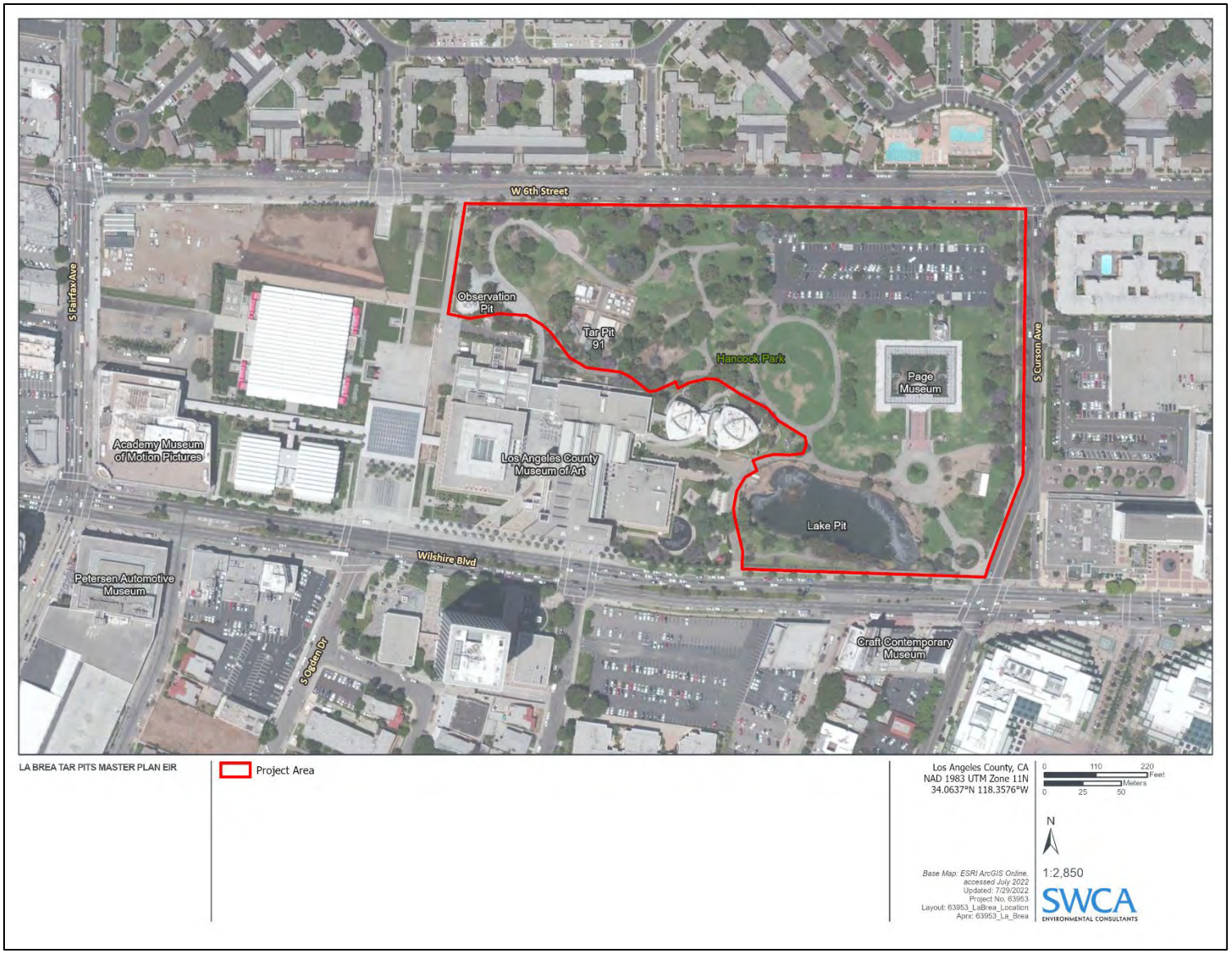

Figure 2. Project location map.

1.1 Existing Conditions and Surrounding Land Uses

The project site includes 13 acres of the eastern and northwestern portions of Hancock Park and broadly encompasses what is known as the La Brea Tar Pits, which includes the Page Museum (see Figure 2). The entirety of Hancock Park is enclosed within an 8- to 10-foot-high metal fence, which serves to secure the site by providing full closure of Hancock Park when the La Brea Tar Pits, Page Museum, and LACMA are closed in the evenings.

The George C. Page Museum is approximately 63,200 square feet and is located on the eastern portion of the project site. The project site contains multiple active fossil quarries, commonly called "tar pits." The active tar pits (Pits 3, 4, 9, 13, 61, 67, and 91) are located within the northwestern portion of the project site, along with the Observation Pit on the western boundary of the project site. Project 23[1] and Pit 91 are active fossil recovery and excavation sites also located in the northwestern portion of the project site. The Lake Pit is the largest paleontological excavation pit on the grounds of Hancock Park, located in the southeastern portion of the project site.

The project site includes an approximately 28,000-square-foot multipurpose grass lawn, known as the Central Green, located to the west of the Page Museum. Parking for the La Brea Tar Pits is located in the northeast corner of the project site, at the corner of South Curson Avenue and West 6th Street (see Figure 2). Vehicles enter and depart the lot from both directions on South Curson Avenue.

The project site is surrounded by a variety of commercial uses, museums, residential buildings, and schools. The project site is bounded by the Park La Brea Pool and multi-family residential uses to the north across West 6th Street, commercial and residential uses to the east across South Curson Avenue, the Craft Contemporary Museum and other museum and commercial uses south across Wilshire Boulevard, and museum and commercial uses to the west (see Figure 2).

2.2 Project Description

The project would result in a reimagined site design, expansion, and upgrades for the La Brea Tar Pits complex and portions of Hancock Park, including renovations to the Page Museum (Figure 3). Table 1 provides a summary of the project components; more detail on the project components is provided following the table.

2.2.1 Page Museum Renovations

The project would renovate the existing Page Museum within the same footprint as the existing building (currently approximately 63,200 square feet) to allow for enlarged exhibition space, additional storage, a ground floor café, and retail space. The central atrium would be renovated to provide additional exhibitions and provide additional classroom and laboratory space. The second floor of the Page Museum would contain two classrooms and a multipurpose space. An outdoor café and bar would be located next to these spaces on the center terrace on the west side of the Page Museum. A sloped green roof would be installed to the north of the Page Museum and would curve to the west. The project would add several sustainability features to the Page Museum. The features include enhanced daylighting, rainwater collection leading to bioswales, a sloped green roof, and rooftop solar photovoltaic panels.

[1] During construction on the LACMA parking garage in 2006, 16 new paleontological deposits were discovered, including an almost-complete skeleton of an adult mammoth. Given the size of the discoveries, 23 large wooden boxes were built around the various deposits, allowing many of the discoveries to remain intact. "Project 23" has now become the short-hand descriptor for the location and activities related to the excavation of deposits within the 23 large wooden boxes that is now occurring in a portion of the La Brea site.

Table 1. Project Components Summary

Project Component	Description
Page Museum Renovations	Renovate existing building in same footprint (approximately 63,200 square feet). Demolish existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. Construct new 2,000-gross-square-foot (gsf) satellite maintenance and support building.
New Museum Building	Construct a new two-story 40,000-gsf museum building northwest of the Page Museum, including two new theaters.
Wilshire Gateway	Renovate the existing entrance to the La Brea Tar Pits at Wilshire Boulevard and South Curson Avenue with shaded canopy and new welcome pavilion.
The Lake Pit	Construct a pedestrian bridge and walking path over the Lake Pit. Install a new garden bioswale.
6th Street Gateway	Renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA service drive with shaded canopy and new welcome pavilion.
Tar Pits (Pits 3, 4, 9, 13, 61, 67, and 91; Project 23)	Renovate the existing facilities at all the tar pits in the northwestern portion of the project site.
Pedestrian Path and Recreation Areas	Reconfigure the existing pedestrian pathways on-site into a continuous 1-kilometer-long paved pedestrian path linking existing features on the project site. Improvements to the Central Green (establish a drivable path for food truck access). Establish a children's play area, picnic areas, and a small dog park west of the 6th Street Gateway.
Circulation and Parking	Expand existing parking lot from 63,000 square feet to 65,000 square feet and relocate approximately 50 to 70 feet to the north. This would require removal and relocation of existing trees on-site. Increase vehicle parking spaces approximately 5 to 15 spaces for a total of 160 to 170 vehicle parking spaces. Addition of new landscaping and vehicle access lanes to the parking lot. Establish new school drop-off/loading area approximately 215 to 230 feet long on South Curson Avenue adjacent to the Wilshire Gateway picnic area.
Landscaping Concept Plan	Establish three distinct landscaping zones encircled by looping pedestrian path. Creation of biofiltration areas for stormwater management. Introduction or relocation of approximately 84 trees from existing locations on-site to new locations on-site.

In addition, the project would demolish the existing maintenance building and service facilities along the northern boundary, directly west of the parking lot. A new 2,000-gross-square-foot (gsf) satellite maintenance and support building would be constructed for additional storage, administration, and research space directly west of the parking lot.

Figure 3. Proposed site plan.

2.2.2 New Museum Building

A new two-story museum building would be located to the northwest of the Page Museum (see Figure 3). The building would be approximately 40,000 gsf and would increase the total museum square footage to 104,000 gsf. The new museum building would include an extended central lobby, exhibit spaces, two theaters, a mechanical equipment room, research and collections rooms, administration spaces, and a loading dock.

The Page Museum and new museum building would be continuously connected on the first floor. The first-floor central lobby would face southwest toward the Central Green and branch off into the Page Museum to the east and the new museum building to the west. An updated retail and café space would be located off the lobby and look out over the Central Green. The Page Museum and the new museum buildings would be disconnected on the second floor, which would rise above the earthen berm. The separated facilities would be accessible through sloped outdoor walkways from the Central Green or interior staircases in the museum. There would be pedestrian entrances leading into the central lobby from the Central Green and from the parking lot. The existing Page Museum entrance would be converted to an educational group and tour entrance, which would be connected to a new school drop-off area on South Curson Avenue.

2.2.3 Entrance Renovation and Other Internal Circulation Improvements

The project would renovate the existing entrance to the La Brea Tar Pits located at Wilshire Boulevard and South Curson Avenue. A large, shaded canopy would stretch down Wilshire Boulevard and curve around to South Curson Avenue to create a new welcome pavilion and shaded entry plaza; this would provide orientation, spaces for gathering and queuing, and restrooms (see Figure 3). A picnic area would also be located under the shaded canopy.

A pedestrian bridge and walking path would be constructed over the Lake Pit. Directly to the east of the Lake Pit, a new garden bioswale would be installed to manage stormwater and would include vegetation related to the relocated mammoths and mastodon sculptures.

A school drop-off area on South Curson Avenue would lead directly to the education museum entrance, enabling the choreography of student tour itineraries that are distinct from general museum visitors and other tour groups.

The project would renovate the existing entrance at the northwest corner of West 6th Street and the entrance to the LACMA parking garage. Similar to the Wilshire Gateway, a shaded canopy and welcome pavilion would provide orientation, legibility, and amenities. As a visible point of arrival from the residential communities to the north, this new entry would welcome visitors to a shaded park space where community park and recreational needs are balanced with the research activities of La Brea. Under the canopy of shade trees, visitors would find diverse destinations, including play areas, picnic areas, seating and interpretation zones at the protected tar seeps, the gentle topography and bioswales along Oil Creek, and the revitalized destinations of the Dorothy Brown Amphitheater, Observation Pit, and Pit 91. Along the south edge of the loop path, connections would allow access to other Hancock Park programs and transportation connections.

2.3 Construction Time Frame and Phasing

Construction of the project, from mobilization to the site to final completion, is expected to occur between 2024 and 2028, and would last for approximately 4 years. The project would be constructed in five

phases: 1) demolition and site preparation of the project site; 2) installation of infrastructure improvements; 3) development of the proposed new museum building and parking lot; 4) landscaping and hydroseeding; and 5) roadway improvements.

The energy analysis is based on default values in the latest versions of the California Emission Estimator Model (CalEEMod) Version 2022.1 (California Air Pollution Officers Association 2022) and Emission Factors Model (California Air Resources Board [CARB] 2021). Accordingly, this energy analysis has been conducted with the most recent available tools prepared and accepted by the regulatory agencies. The project phases have been grouped into six CalEEMod phases based on the types of equipment and workload: 1) demolition; 2) site preparation; 3) grading; 4) building construction; 5) paving; and 6) architectural coating.

The 13-acre project site has been divided into the following land uses for purposes of CalEEMod: 1) parking; 2) other non-asphalt surfaces; 3) educational library; and 4) recreational city park. This energy analysis includes quantification of electricity, natural gas, gasoline, and diesel fuel that would be required to construct and operate the project. Construction energy use includes off-road equipment and on-road mobile sources. Sources of operational energy use include building energy use, parking area energy use, on-road mobile sources, and water distribution and treatment.

3 ENVIRONMENTAL SETTING

3.1 Energy Profile

Total energy usage in California was 6,923 trillion British Thermal Units (Btu) in 2020 (the most recent year for which these specific data are available), which equates to an average of 175 million Btu per capita. These figures place California second among the nation's 50 states in total energy use and 48th in per-capita consumption. Of California's total energy usage, the breakdown by sector is roughly 34% transportation, 25% industrial, 20% commercial, and 22% residential. Electricity and natural gas in California are primarily consumed by stationary users such as residential dwellings and commercial and industrial facilities, whereas petroleum-based fuel is primarily consumed by transportation-related energy use (U.S. Energy Information Administration [EIA] 2020a).

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Approximately 70% of the electrical power needed to meet California's demand is produced in the state, while approximately 30% is imported from power-generating facilities outside of California, including imports from Mexico. In 2021, California's in-state electricity use was derived from natural gas (50%), coal (0.2%), large hydroelectric resources (6%), nuclear sources (8%), and renewable resources that include geothermal, biomass, small hydroelectric resources, wind, and solar (35%) (California Energy Commission [CEC] 2021a).

3.2 Electricity

In 2021, total system electric generation for California was 277,764 gigawatt-hours (GWh), increased 2% from 2020's total generation. Electricity from non–carbon dioxide-emitting electric generation categories (i.e., nuclear, large hydroelectric, and renewable generation) accounted for 49% of total in-state generation for 2021, compared to 51% in 2020 (CEC 2021a). The change is attributable to the continued impacts from California drought. In-state hydroelectric generation was significantly reduced, some 32% lower than 2020 generation levels. The net imports increased by about 2.4% in 2021, partially offsetting the decreased output from California's hydroelectric power plants. The overall decline observed in

California's total system electric generation for 2020 is consistent with the recently published *California Energy Demand 2018–2030 Revised Forecast* (CEC 2018).

Total system electric generation for California was slightly increased in 2021. Factors contributing to the increase in total system electric generation include growth in the number of light-duty electric vehicles registered in the state, increased manufacturing electricity consumption, and decreases in savings from energy efficiency programs, as population increases.

Increasingly, electricity is used in multiple transportation modes, including light-duty vehicles, transit buses, and light and heavy rail. In California, electricity use is forecast to emerge in battery-electric medium-duty trucks, battery-electric buses, and high-speed rail. The CEC forecasts that the statewide annual electricity demand for electricity-powered transportation modes will increase from its current level of 2,000 GWh to between 12,000 and 18,000 GWh by 2030, depending on technology development and market penetration of the various vehicle types (CEC 2021b).

The electricity services provided to the project site would be provided by the Los Angeles Department of Water and Power (LADWP), which is a proprietary department of the City of Los Angeles. The LADWP provides electrical service throughout the city of Los Angeles, serving approximately 4 million people within a service area of approximately 465 square miles. The Valley Planning District includes the LADWP service area north of Mulholland Drive, and the Metropolitan Planning District includes the LADWP service area south of Mulholland Drive. The project site is located within LADWP's Metropolitan Planning District.

LADWP generates power from a variety of energy sources, including hydropower, coal, gas, nuclear sources, and renewable resources, such as wind, solar, and geothermal sources. According to LADWP's 2017 Power Strategic Long-Term Resource Plan, LADWP has a net dependable generation capacity greater than 7,531 MW (LADWP 2017). On August 31, 2017, LADWP's power system experienced a record instantaneous peak demand of 6,502 MW (LADWP 2022). Approximately 35% of LADWP's 2021 electricity purchases were from renewable sources, which is similar to the 32% statewide percentage of electricity purchases from renewable sources (LADWP 2021). The annual electricity sale to customers for the 2018–2019 fiscal year was approximately 22,663 million kilowatt hours (kWh). LADWP customers consume approximately 10% of all the electricity consumed in California, while LADWP has a transmission capacity of approximately 25% of California's total transmission capacity. LADWP owns and/or operates approximately 20,000 miles of alternating current (AC) and direct current (DC) transmission and distribution circuits, operating at voltages ranging from 120 volts to 500 kilovolts (kV), which are used to deliver electricity from generating plants to customers. The LADWP transmission and distribution system supplies power to the project site from as many as 34 different sources. LADWP supplies electrical power to the project site from electrical service lines located in the project vicinity.

3.3 Natural Gas

One third of energy commodities consumed in California is natural gas. Although natural gas is the most common energy source for electricity generation in California, 90% of the state's natural gas is imported from the Rocky Mountain region, the Southwest, and Canadian basins. Californians consumed 13,158 million therms of natural gas in 2019, which is equal to approximately 1,315,800,000 million Btu (MMBtu) (California Public Utilities Commission [CPUC] 2021). The natural gas market continues to evolve and service options expand, but its use falls mainly into the following four sectors: residential, commercial, industrial, and electric power generation. In addition, natural gas is a viable alternative to petroleum fuels for use in cars, trucks, and buses. Nearly 45% of the natural gas burned in California is used for electricity generation, and most of the remainder is consumed in the residential (21%), industrial (25%), and commercial (9%) sectors. California depends on out-of-state imports for nearly 90% of its

natural gas supply (CPUC 2021). Natural gas has become an increasingly important source of energy since the majority of the state's power plants rely on this fuel.

The natural gas services provided to the project site would be provided by LADWP. Natural gas provides almost one third of the state's total energy requirements and is used in electricity generation space heating, cooking, watering, industrial processes, and as transportation fuel. Natural gas is provided by Southern California Gas Company (SoCalGas). SoCalGas gas serves approximately 21.4 million customers and more than 500 communities encompassing approximately 20,000 square miles throughout central and southern California. SoCalGas receives gas supplies from several sedimentary basins in the western United States and Canada, including supply basins located in New Mexico, west Texas, the Rocky Mountains, and western Canada, as well as local California supplies. The traditional, southwestern United States sources of natural gas will continue to supply most of SoCalGas's natural gas. Gas supply available to SoCalGas from California sources was approximately 2.4 billion cubic feet per day in 2021.

3.4 Transportation Fuels

The energy consumed by the transportation sector accounts for roughly 86% of California's petroleum products demand. Gasoline and diesel, both derived from petroleum (also known as crude oil), are the two most common fuels used for vehicular travel. According to the CEC, the state relies on petroleum-based fuels for 98% of its transportation needs. The transportation sector, including on-road and rail transportation (but excluding aviation), accounts for more than 95% of all motor gasoline use in the United States, at roughly 3.28 million barrels consumed in 2018. California has the second highest transportation-sector petroleum fuel consumption rate of any state and the highest motor gasoline consumption rate. In 2019, approximately 30% of California's crude oil was produced within the state, about 12% was produced in Alaska, and the remaining 58% was produced in foreign lands (CEC 2021a).

In 2019, taxable gasoline sales (including aviation gasoline) in California accounted for approximately 15.4 billion gallons of gasoline, and taxable diesel fuel sales accounted for approximately 3.1 billion gallons of diesel fuel (California Department of Tax and Fee Administration [CDTFA] 2021).

The CEC forecasts that demand for gasoline in California will range from 12.1 billion to 12.6 billion gallons in 2030, with most of the demand generated by light-duty vehicles. While the models show an increase in light-duty vehicles along population and income growth over the forecast horizon, total gasoline consumption is expected to decline, primarily due to increasing fuel economy (stemming from federal and state regulations) and gasoline displacement from the increasing market penetration of zero emission vehicles (ZEVs). For diesel, demand is forecast to increase modestly by 2030, following the growth of California's economy, but would be tempered by an increase in fleet fuel economy and market penetration of alternative fuels, most prominently by natural gas in the medium- and heavy-duty vehicle sectors (EIA 2020b).

As of 2019, California's oil fields make it the seventh largest petroleum-producing state in the United States (federal off-shore excluded), behind Texas, North Dakota, New Mexico, Oklahoma, Colorado, and Alaska. Crude oil is moved from area to area within California through a network of pipelines that carry it from both onshore and offshore oil wells to the refineries that are located in the San Francisco Bay Area, the Los Angeles area, and the Central Valley. As of January 1, 2020, 14 petroleum refineries operate in California, processing approximately 2.0 million barrels per day of crude oil. Other transportation fuel sources used in California include alternative fuels, such as methanol and denatured ethanol (alcohol mixtures that contain no less than 70% alcohol), natural gas (compressed or liquefied), liquefied petroleum gas, hydrogen, and fuels derived from biological materials (i.e., biomass) (CEC 2021c).

According to the CEC, transportation accounted for 34% of California's total energy consumption in 2020 (EIA 2020a). In 2021, California consumed 13.8 billion gallons of gasoline and 3.1 billion gallons of diesel fuel (CDTFA 2021). Petroleum-based fuels currently account for 89% of California's transportation energy sources. However, the State is now working on developing flexible strategies to reduce petroleum use. Over the last decade, California has implemented several policies, rules, and regulations to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and greenhouse gases (GHGs) from the transportation sector, and reduce vehicle miles traveled (VMT). Accordingly, gas consumption in California has declined. The CEC predicts that the demand for gasoline will continue to decline over the next 10 years, and there will be an increase in the use of alternative fuels. According to CARB's EMFAC database, Los Angeles County on-road transportation sources consumed 3.81 billion gallons of gasoline and 0.51 billion gallons of diesel fuel in 2021 (CARB 2021).

The existing on-site land uses currently generate a demand for transportation-related fuel use as a result of vehicle trips to and from the project site. Persons traveling to and from the project site also have the option of using public transportation to reduce transportation-related fuel use. The project site is located in an area well served by public transit provided by Los Angeles County Metropolitan Transportation Authority, the Los Angeles Department of Transportation, and the Antelope Valley Transit Authority, including the future Wilshire/Fairfax Station (as part of the Metro Purple Line Extension Project).

4 REGULATORY SETTING

4.1 Federal

Federal policies and regulations set broad energy efficiency standards and incentives for consumer products, automobile and fuel efficiency, etc. Such requirements, as those listed below, tend to be applicable to the manufacturing sector and not directly applicable to the project, but are listed here for informational purposes.

4.1.1 National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products (including hybrid vehicles), constructing energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

Executive Order (EO) 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the federal government and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of EO 13423 were expanded upon in EO 13514 (Federal Leadership in Environmental, Energy, and Economic Performance), which was signed in 2009.

The Energy Policy and Conservation Act of 1975 (EPCA) is a United States Act of Congress that responded to the 1973 oil crisis by creating a comprehensive approach to federal energy policy. The primary goals of the EPCA are to increase energy production and supply, reduce energy demand, provide energy efficiency, and give the executive branch additional powers to respond to disruptions in

energy supply. Most notably, EPCA established the Strategic Petroleum Reserve, the Energy Conservation Program for Consumer Products, and Corporate Average Fuel Economy regulations.

4.1.2 Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting mandatory Renewable Fuel Standards (RFS) that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- Requiring approximately 25% greater efficiency for lightbulbs by phasing out incandescent lightbulbs between 2012 and 2014; requiring approximately 200% greater efficiency for lightbulbs, or similar energy savings, by 2020; and
- While superseded by the United States Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA) actions described above, 1) establishing miles per gallon targets for cars and light trucks, and 2) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

Additional provisions of the Energy Independence and Security Act address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of “green jobs.” A “green job,” as defined by the United States Department of Labor, is a job in business that produces goods or provides services that benefit the environment or conserve natural resources.

4.1.3 Corporate Average Fuel Economy (CAFE) Standards

Established by the U.S. Congress in 1975, the Corporate Average Fuel Economy (CAFE) Standards (49 Code of Federal Regulations 531 and 533) reduce energy consumption by increasing the fuel economy of cars and light trucks. The NHTSA and EPA jointly administer the CAFE standards. The U.S. Congress has specified that CAFE standards must be set at the “maximum feasible level” with consideration given for: 1) technological feasibility; 2) economic practicality; 3) effect of other standards on fuel economy; and 4) need for the nation to conserve energy. When these standards are raised, automakers respond by creating a more fuel-efficient fleet. In 2012, the NHTSA established final passenger car and light truck CAFE standards for model years 2017 through 2021, which the agency projects will require in model year 2021, on average, a combined fleet-wide fuel economy of 40.3 to 41.0 miles per gallon (mpg). Fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by EPA and NHTSA. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014 through 2018, and result in a reduction in fuel consumption from 6% to 23% over the 2010 baseline, depending on the vehicle type.

The EPA and NHTSA have also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021 through 2027 and require the phase-in of a 5% to 25% reduction in fuel consumption over the 2017 baseline, depending on the compliance year and vehicle type.

In March 2020, the EPA and NHTSA issued the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule that would maintain the CAFE standards applicable in model year 2020 for model years 2021 through 2026. The estimated CAFE standards for model year 2020 are 43.7 mpg for passenger cars and 31.3 mpg for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. However, consistent with President Biden's executive order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, the EPA and NHTSA are now evaluating whether and how to replace the SAFE Rule.

4.2 State

4.2.1 California Building Energy Efficiency Standards (Title 24, Part 6)

The 2019 California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations [CCR], Title 24, Part 6), commonly referred to as "Title 24," became effective on January 1, 2020. In general, Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Under 2019 Title 24 standards, nonresidential buildings would use about 30% less energy, mainly due to lighting upgrades, when compared to those constructed under 2016 Title 24 standards. The 2019 Title 24 standards require installation of energy-efficient windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in homes and businesses. All new structures associated with the project would be required to comply with Title 24 standards for energy efficiency.

4.2.2 California Green Building Standards (CALGreen, or Title 24 Part 11)

The CALGreen Code (CCR, Title 24, Part 11), is a statewide mandatory construction code that was developed and adopted by the California Building Standards Commission and the California Department of Housing and Community Development. CALGreen standards require new residential and commercial buildings to comply with mandatory measures under five topical areas: planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt, which encourage or require additional measures in the five green building topics. The most recent update to the CALGreen Code was adopted in 2019 and went into effect on January 1, 2020. CALGreen requires new buildings to reduce water consumption by 20%, divert 50% of construction waste from landfills, and install low pollutant-emitting materials.

4.2.3 Appliance Efficiency Regulations, California Code of Regulations Title 20

California's Appliance Efficiency Regulations (20 CCR Part 1601-1608) contain standards for both federally regulated appliances and non-federally regulated appliances. The regulations are updated regularly to allow consideration of new energy efficiency technologies and methods. The current regulations were adopted by the CEC on November 18, 2009. The standards outlined in the regulations apply to appliances that are sold or offered for sale in California. More than 23 different categories of appliances are regulated, including refrigerators, freezers, water heaters, washing machines, dryers, air conditioners, pool equipment, and plumbing fittings.

4.2.4 Renewables Portfolio Standard Program

First established in 2002 under Senate Bill (SB) 1078, California's Renewables Portfolio Standards (RPS) requires retail sellers of electric services to increase procurement from eligible renewable energy resources to 33% by 2020 and 50% by 2030. SB 350, signed October 7, 2015, is the Clean Energy and Pollution Reduction Act of 2015. The objectives of SB 350 are: 1) to increase the procurement of electricity from renewable sources from 33% to 50%; and 2) to double the energy savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation. On September 10, 2018, former Governor Jerry Brown signed SB 100, which further increased California's RPS and requires retail sellers and local publicly owned electric utilities to procure eligible renewable electricity for 44% of retail sales by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, and that the CARB should plan for 100% eligible renewable energy resources and zero-carbon resources by December 31, 2045.

The CPUC and the CEC jointly implement the RPS program. The CPUC's responsibilities include: 1) determining annual procurement targets and enforcing compliance; 2) reviewing and approving each investor-owned utility's renewable energy procurement plan; 3) reviewing contracts for RPS-eligible energy; and 4) establishing the standard terms and conditions used in contracts for eligible renewable energy. In March 2021, the CEC, CPUC, and CARB issued an SB 100 Joint Agency Report that assesses barriers and opportunities to implementing the 100% clean electricity policy. The report's initial findings suggest that the goals of SB 100 are achievable, though opportunities remain to reduce overall system costs; however, the report also notes that the findings are intended to inform state planning and are not intended as a comprehensive nor prescriptive roadmap to 2045, and future work is needed on critical topics such as system reliability and land use to further address energy equity and workforce needs. On April 12, 2011, Governor Brown signed into law SB 2X, which modified California's RPS program to require that both public and investor-owned utilities California receive at least 33% of their electricity from renewable sources by the year 2020. SB 2X also requires regulated sellers of electricity to meet an interim milestone of procuring 25% of their energy supply from certified renewable sources by 2016. These levels of reduction are consistent with the LADWP's commitment to achieve 35% renewable energy by 2020. LADWP indicated that 35.2% of its electricity came from renewable resources in year 2021 (LADWP 2021). Therefore, under SB 2X, LADWP currently meets its RPS requirement.

4.2.5 SB 375 (Sustainable Communities Strategies)

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan (since updated to 2022 Climate Change Scoping Plan [CARB 2022]) for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associate with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations. The Southern California Association of Governments (SCAG) is the metropolitan planning organization for the Southern California region, which includes Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial Counties.

4.2.6 Executive Order S-14-08 and S-21-09

In November 2008, then-Governor Schwarzenegger signed EO S-14-08, which expanded the state's RPS to 33% renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the RPS by signing EO S-21-09, which directed the CARB under its

Assembly Bill (AB) 32 authority to enact regulations to help the state meet its RPS goal of 33% renewable energy by 2020.

4.2.7 SB 350—Clean Energy and Pollution Reduction Act of 2015

SB 350, also known as the Clean Energy and Pollution Reduction Act of 2015, was enacted on October 7, 2015, and provides a new set of objectives in clean energy, clean air, and pollution reduction by 2030. The objectives include the following:

1. To increase from 33% to 50% by December 31, 2030, the procurement of California's electricity from renewable sources.

2. To double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

4.2.8 Senate Bill 100

On September 10, 2018, then-Governor Brown signed SB 100, establishing that 100% of all electricity in California must be obtained from renewable and zero-carbon energy resources by December 31, 2045. SB 100 also creates new standards for the RPS goals that were established by SB 350 in 2015. Specifically, the bill increases required energy from renewable sources for both Investor Owned Utilities and Publicly Owned Utilities from 50% to 60% by 2030. Incrementally, these energy providers are also required to have a renewable energy supply of 33% by 2020, 44% by 2024, and 52% by 2027.
The updated RPS goals are considered achievable, since many California energy providers are already meeting or exceeding the RPS goals established by SB 350. On the same day that SB 100 was signed, then-Governor Brown signed EO B-55-18, with a new statewide goal to achieve carbon neutrality (zero-net GHG emissions) by 2045 and to maintain net negative emissions thereafter.

4.2.9 Senate Bill 1389

SB 1389 (PRC Sections 25300–25323) requires the CEC to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (PRC Section 25301[a]). The 2021 Integrated Energy Policy Report, the latest published report from CEC, provides the results of the CEC's assessments related to energy sector trends, building decarbonization and energy efficiency, zero-emission vehicles (ZEVs), energy equity, climate change adaptation, electricity reliability in Southern California, natural gas assessment, and electricity, natural gas, and transportation energy demand forecasts (CEC 2022a).

4.2.10 2017 Climate Change Scoping Plan

In response to the passage of AB 32 and the identification of the statewide 2030 GHG reduction target (i.e., 40% below statewide 1990 level GHG emissions by 2030), CARB adopted the 2017 Climate Change Scoping Plan in December 2017. In May 2022, an updated climate scoping plan was published. The 2022 Climate Change Scoping Plan identifies technologically feasible and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health. The 2022 Climate Change Scoping Plan includes policies to require direct GHG reductions at some of the state's largest stationary sources and mobile sources. These policies include the use of lower-GHG fuels,

efficiency regulations, and the Cap-and-Trade program, which constrains and reduces emissions at covered sources.

4.2.11 AB 1007 (Pavley)—Alternative Fuel Standards

AB 1007 (Pavley, Chapter 371, Statutes of 2005) required the CEC to prepare a state plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the State Alternative Fuels Plan in partnership with CARB and in consultation with other state, federal, and local agencies. The final State Alternative Fuels Plan, published in December 2007, attempts to achieve an 80% reduction in GHG emissions associated with personal modes of transportation, even as California's population increases.

4.2.12 California Assembly Bill 1493 (AB 1493, Pavley)

In response to the transportation sector accounting for more than half of California's carbon dioxide emissions, AB 1493 (commonly referred to as CARB's Pavley regulations), enacted on July 22, 2002, requires CARB to set GHG emission standards for new passenger vehicles, light-duty trucks, and other vehicles manufactured in and after 2009 whose primary use is non-commercial personal transportation. Phase I of the legislation established standards for model years 2009–2016 and Phase II established standards for model years 2017–2025. In September 2019, the EPA published the SAFE Vehicles Rule in the Federal Register (Vol. 84, No. 188, Friday, September 27, 2019, Rules and Regulations, 51310–51363) that maintains the vehicle mpg standards applicable in model year 2020 for model years 2021 through 2026. In November 2019, California and 23 other States and environmental groups filed a petition in the U.S. District Court in Washington, D.C., for the EPA to reconsider the published rule. The Court has not yet ruled on these petitions.

In March 2020, despite the pending petitions, the U.S. Department of Transportation and the EPA issued the SAFE Vehicles Rule, which amends existing CAFE standards and tailpipe carbon dioxide emissions standards for passenger cars and light trucks.

4.2.13 Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS), established in 2007 through EO S-1-07 and administered by CARB, requires producers of petroleum-based fuels to reduce the carbon intensity of their products, starting with a 0.25% reduction in 2011. and culminating in a 10% total reduction in 2020. In September 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the program, including a doubling of the carbon intensity reduction to 20% by 2030.

Petroleum importers, refiners, and wholesalers can either develop their own low carbon fuel products or buy LCFS credits from other companies that develop and sell low carbon alternative fuels, such as biofuels, electricity, natural gas, and hydrogen.

4.2.14 Executive Order B-16-12—2025 Goal for Zero Emission Vehicles

In March 2012, then-Governor Brown issued an executive order establishing a goal of 1.5 million ZEVs on California roads by 2025. In addition to the ZEV goal, EO B-16-12 stipulated that by 2015, all major cities in California will have adequate infrastructure and be "zero-emission vehicle ready"; that by 2020, the state will have established adequate infrastructure to support 1 million ZEVs; and that by 2050, virtually all personal transportation in the state will be based on ZEVs, and GHG emissions from the transportation sector will be reduced by 80% below 1990 levels.

4.2.15 CARB's Advanced Clean Car Program

The Advanced Clean Cars emissions-control program was approved by CARB in 2012, and is closely associated with the Pavley regulations. The program requires a greater number of zero-emission vehicle models for years 2015 through 2025 to control smog, soot, and GHG emissions. This program includes the Low-Emissions Vehicle (LEV) regulations to reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles; and the ZEV regulations to require manufactures to produce an increasing number of pure ZEVs (meaning battery and fuel cell electric vehicles) with the provision to produce plug-in hybrid electric vehicles between 2018 and 2025. Due to the federal adoption of the Final Safer Affordable Fuel Efficient (SAFE) Rule, new cars of model years 2021 through 2026 are not currently required to achieve the fuel economy targets set by the Advanced Clean Cars program.

The Mobile Source Strategy of 2016 includes an expansion of the Advanced Clean Cars program and further increases the stringency of GHG emissions for all light-duty vehicles, and 4.2 million zero emission and plug-in hybrid light-duty vehicles by 2030. It also calls for more stringent GHG requirements for light-duty vehicles beyond 2025, as well as GHG reductions from medium-duty and heavy-duty vehicles and increased deployment of zero-emission trucks primarily for Class 3 through Class 7 "last mile" delivery trucks in California. Statewide, the Mobile Source Strategy would result in a 45% reduction in GHG emissions and a 50% reduction in the consumption of petroleum-based fuels.

CARB's Mobile Source Strategy includes measures to reduce total light-duty VMT by 15% compared to forecasted 2050 VMT with no measures enacted. In addition to limiting exhaust from idling trucks, CARB also promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower, such as bulldozers, loaders, backhoes, and forklifts, as well as many other self-propelled off-road diesel vehicles. The In-Use Off-Road Diesel-Fueled Fleets regulation adopted by CARB on July 26, 2007, aims to reduce emissions by installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with newer emission-controlled models (13 CCR Section 2449). The compliance schedule requires full implementation by 2023 in all equipment for large and medium fleets and by 2028 for small fleets.

4.2.16 Airborne Toxic Control Measure to Limit Diesel-Fueled Vehicle Idling

In 2004, CARB adopted an Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling in order to reduce public exposure to diesel particulate matter emissions (13 CCR Section 2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at any given location. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling.

In 2021, California consumed 13.8 billion gallons of gasoline and 3.1 billion gallons of diesel fuel (CDTFA 2021). Off-road construction equipment also consumes fuel while idling. CARB implemented the Airborne Toxic Control Measure (ATCM) to Limit Diesel-Fueled Commercial Motor Vehicle Idling limits idling to 5 minutes at any one location. This was done to save fuel because CARB estimated that heavy-duty vehicles (off-road equipment) can consume up to 1 gallon of diesel fuel per hour of idling, which can total to 1,500 gallons of diesel fuel per year for vehicles that could idle for 1,500 hours in a year. By implementing this rule, idling is greatly reduced, and the use of diesel fuel is reduced.

4.2.17 Executive Order B-48-18

On January 26, 2018, then-Governor Brown issued an executive order establishing a goal of 5 million ZEVs on California roads by 2030, and spur the installation and construction of 250,000 plug-in electric vehicle chargers, including 10,000 DC fast chargers, and 200 hydrogen refueling stations by 2025.

4.2.18 Executive Order N-79-20

In September 2020, Governor Newsom signed EO N-79-20, which sets a new State goal that 100% of in-state sales of new passenger cars and trucks will be zero-emission by 2035; that 100% of medium- and heavy-duty vehicles in the state will be zero-emission by 2045 for all operations where feasible, as well as by 2035 for drayage trucks; and that 100% of off-road vehicles and equipment will be zero-emission by 2035 where feasible. This order calls upon state agencies including CARB, the CEC, the CPUC, the Department of Finance, and others to develop and propose regulations and strategies to achieve these goals.

4.3 Regional

4.3.1 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

SB 375 requires each metropolitan planning organization to prepare a Sustainable Communities Strategy (SCS) in their regional transportation plan (RTP). In general, the SCS outlines a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light-duty trucks and thereby reduce GHG emissions from these sources. For the SCAG region, the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), adopted on September 3, 2020, is the current RTP/SCS and is an update to the 2016-2040 RTP/SCS.

The 2020-2045 RTP/SCS focuses on the continued efforts of the previous RTP/SCS plans for an integrated approach in transportation and land use strategies in development of the SCAG region through horizon year 2045. The 2020-2045 RTP/SCS projects that the SCAG region will meet the GHG per-capita reduction targets established for the SCAG region of 8% by 2020 and 19% by 2035. Additionally, its implementation is projected to reduce VMT per capita for the year 2045 by 4.1% compared to baseline conditions for the year. Rooted in the 2008 and 2012 RTP/SCS plans, the 2020-2045 RTP/SCS includes “Core Vision” that centers on maintaining and better managing the transportation network for moving people and goods while expanding mobility choices by locating housing, jobs, and transit closer together, and increasing investments in transit and complete streets.

4.4 County of Los Angeles

4.4.1 County of Los Angeles General Plan

The County of Los Angeles General Plan directs future growth and development and establishes goals, policies, and objectives that are established by the County to guide development in the unincorporated areas of the county and projects that are developed under County guidance. The County General Plan is also intended to serve as an advisory countywide document to coordinate land use planning, public service and facilities planning, circulation, environmental management and regional land use, and transportation initiatives with the county’s 88 incorporated cities.

The adopted County General Plan contains an Air Resources Element that addresses air quality and GHG emissions. Relevant goals encourage mixed-use development, the use of "green building" principles, energy and water efficiency, reducing vehicle miles traveled and vehicle trips, and promoting alternative modes of transportation. The Air Quality Element of the County General Plan establishes the following goals and policies applicable to the project pertaining to energy:

- Goal AQ3: Implementation of plans and programs to address the impact of climate change.
    - Policy AQ 3.2 - Reduce energy consumption of County operations by 20% by 2015.
    - Policy AQ 3.3 - Reduce water consumption of County operations.
    - Policy AQ 3.5 - Encourage energy conservation in new development and municipal operations.
    - Policy AQ 3.6 - Support rooftop solar facilities on new and existing buildings.

4.5 City of Los Angeles

While the project site is located within the city of Los Angeles, it is owned by the County and is proposed for uses that benefit the public. Accordingly, the project is subject to the regulatory controls of the County of Los Angeles and not the City of Los Angeles. Nonetheless, the policy and regulatory documents of the City of Los Angeles that are most relevant to the project are provided herein for informational purposes.

4.5.1 City of Los Angeles Green LA Action Plan

The City of Los Angeles adopted the Green LA Action Plan to provide energy conservation goals and objectives for its departments, including the LADWP, and to set a policy framework for future energy conservation programs. The plan, published in May 2007, sets forth a goal of reducing the city's GHG emissions to 35% below 1990 levels by the year 2030. Climate LA is the implementation program that provides detailed information about each action item listed in the Green LA framework. Climate LA includes focus areas addressing environmental issues including, but not limited to, energy, water, transportation, and waste. The energy focus area includes action items with measures that aim to increase the use of renewable energy to 35% by 2020, reduce the use of coal-fired power plants, and present a comprehensive set of green buildings policies to guide and support private sector development.

4.5.2 City of Los Angeles Green New Deal

In April 2019, Mayor Eric Garcetti released the Green New Deal, a program of actions designed to create sustainability-based performance targets through 2050 to advance economic, environmental, and equity objectives. The City's Green New Deal is the first 4-year update to the City's first Sustainable City pLAn that was released in 2015, and therefore replaces and supersedes the Sustainable City pLAn. It augments, expands, and elaborates in more detail the City's vision for a sustainable future and it tackles the climate emergency with accelerated targets and new aggressive goals. Within the Green New Deal, climate mitigation is one of eight explicit benefits that help define its strategies and goals. These include reducing GHG emissions through near-term outcomes:

- Reduce potable water use per capita by 22.5% by 2025; 25% by 2035; and maintain or reduce 2035 per-capita water use through 2050.
- Reduce building energy use per square foot for all building types 22% by 2025; 34% by 2035; and 44% by 2050 (from a baseline of 68 thousand British thermal units per square foot in 2015).
- All new buildings will be net zero carbon by 2030 and 100% of buildings will be net zero carbon by 2050.

- Increase cumulative new housing unit construction to 150,000 by 2025; and 275,000 units by 2035.
- Ensure 57% of new housing units are built within 1,500 feet of transit by 2025; and 75% by 2035.
- Increase the percentage of all trips made by walking, biking, micromobility/matched rides, or transit to at least 35% by 2025, 50% by 2035, and maintain at least 50% by 2050.
- Reduce VMT per capita by at least 13% by 2025; 39% by 2035; and 45% by 2050.
- Increase the percentage of electric and zero emission vehicles in the city to 25% by 2025; 80% by 2035; and 100% by 2050.
- Increase landfill diversion rate to 90% by 2025; 95% by 2035 and 100% by 2050.
- Reduce municipal solid waste generation per capita by at least 15% by 2030, including phasing out single-use plastics by 2028 (from a baseline of 17.85 pounds of waste generated per capita per day in 2011).
- Eliminate organic waste going to landfill by 2028.
- Reduce urban/rural temperature differential by at least 1.7 degrees by 2025; and 3 degrees by 2035.
- Ensure the proportion of Angelenos living within 0.5 mile of a park or open space is at least 65% by 2025; 75% by 2035; and 100% by 2050.

4.5.3 City of Los Angeles Green Building Code

Chapter IX of the Los Angeles Municipal Code (LAMC) is referred to as the “Los Angeles Green Building Code”. which incorporates by reference portions of the CALGreen Code. Specific mandatory requirements and elective measures are provided for three categories: 1) low-rise residential buildings; 2) nonresidential and high-rise residential buildings; and 3) additions and alterations to nonresidential and high-rise residential buildings. The Los Angeles Green Building Code includes mandatory measures for newly constructed nonresidential and high-rise residential buildings. The Los Angeles Green Building Code includes some requirements that are more stringent than State requirements such as increased requirements for electric vehicle charging spaces and water efficiency, which results in potentially greater energy demand reductions from improved transportation fuel efficiency and water efficiency.

4.5.4 City of Los Angeles Solid Waste Reduction and Diversion Programs and Ordinances

The waste produced on the project site would be removed by waste haulers subject to the City of Los Angeles solid waste diversion programs and ordinances. The recycling of solid waste materials contributes to reduced energy consumption. Specifically, when products are manufactured using recycled materials, the amount of energy that would have otherwise been consumed to extract and process virgin source material is reduced. For example, in 2015, 3.61 million tons of aluminum were produced by recycling in the United States, saving enough energy to produce electricity to 7.5 million homes.

The City of Los Angeles includes several programs and ordinances related to solid waste reduction and diversion. They include the following: 1) the RENEW LA Plan, which is a resource management blueprint with the aim to achieve a zero waste goal through reducing, reusing, recycling, or converting the resources now going to disposal so as to achieve an overall diversion level of 90% or more by 2025; 2) the Waste Hauler Permit Program, which requires all private waste haulers collecting solid waste to obtain compliance permits and to transport construction and demolition waste to City-certified construction and demolition processing facilities; and 3) the Exclusive Franchise System Ordinance, which, among other requirements, sets maximum annual disposal levels and specific diversion

requirements for franchise waste haulers and the City to promote solid waste diversion from landfills in an effort to meet the City's zero waste goals. These solid waste reduction programs and ordinances not only help to reduce the number of trips to haul solid waste, therefore reducing the amount of petroleum-based fuel, but also help to reduce the energy used to process solid waste.

5 IMPACT ANALYSIS

5.1 Methodology

This analysis addresses the project's potential energy usage, including electricity and transportation fuel. Energy consumption during both construction and operation is assessed. For purposes of this analysis, consistent with Appendix G of the State CEQA Guidelines, impacts associated with energy would be significant if the project would:

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The project's estimated energy consumption was calculated using CalEEMod Version 2022.1. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operation of a variety of land use projects. The model uses widely accepted federal and state models for emission estimates and default data from sources such as EPA AP-42 emission factors, CARB vehicle emission models, and studies from California agencies such as the CEC. The model quantifies direct emissions from construction and operations, as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Additional details regarding CalEEMod assumptions for the project are presented in the *La Brea Tar Pits Master Plan Air Quality and Greenhouse Gas Technical Report* (SWCA 2022). Specific analysis methodologies are discussed below.

5.1.1 Construction Energy Estimates

5.1.1.1 OFF-ROAD EQUIPMENT

Off-road equipment is the most significant source of construction fuel usage. Diesel fuel consumption associated with on-site off-road construction equipment has been estimated based on the construction schedule, equipment list, and CARB-estimated diesel consumption rate for off-road equipment. Details on the construction schedule and equipment are provided in the *La Brea Tar Pits Master Plan Air Quality and Greenhouse Gas Technical Report* (SWCA 2022). For the purposes of the energy analysis, all equipment was assumed to be diesel-fueled; electricity- or gasoline-fueled equipment would not be expected to substantially affect energy resource demands. It is also important to note that engine tier does not affect fuel consumption rates. Fuel consumption rates in gallons per horsepower-hour were calculated from CARB's Off-road Diesel Emission Factors database. Further details on the fuel usage by year, construction phase, and equipment are shown in Appendix A.

5.1.1.2 ON-ROAD VEHICLES

On-road construction vehicles such as light-duty automobiles and trucks that workers would use for commuting to and from the construction site are assumed to be fueled by gasoline; and on-road trucks,

such as vendor and haul trucks for demolition debris, soil, and other material hauling, are assumed to be fueled by diesel fuel. This analysis conservatively assumes that no electric on-road vehicles would be used during construction of the project; electric vehicles would not be expected to substantially affect energy resource demands. The fuel quantities that would be required for on-road vehicles during construction have been calculated based on fuel efficiency factors estimated for each vehicle type using the EMFAC tool (CARB 2021). Fuel efficiency factors and energy use calculations are shown in Appendix A. CalEEMod defaults were used for the trip counts and for worker, vendor, and haul trip lengths. Summaries of the total estimated project construction energy use requirements for diesel fuel and gasoline are presented in Appendix A.

The project would be required to be compliant with the ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling limits idling to 5 minutes at any one location during the estimated 4-year construction period.

5.1.2 Operations

Project operations would require long-term consumption of energy in the form of electricity, natural gas, gasoline, and diesel fuel. The electricity, natural gas, and water usage that would be required for operation of the proposed buildings has been estimated based on project-specific building area estimates and CalEEMod default factors. Electricity would be used as the primary power source for the proposed buildings, including to operate the heating, ventilation, and air conditioning (HVAC) system.

In addition, water use for buildings would require the consumption of electricity to supply and distribute potable water to the buildings' water fixtures and to treat wastewater. Natural gas use for the buildings would primarily be associated with space and water heating. Mobile source fuel use associated with operation of the project has been estimated based on VMT and the fleet-average fuel consumption (in gallons per mile) from EMFAC (CARB 2021). CalEEMod calculates the annual VMT during operations using a fleet mix consisting of all different vehicle types accounting for the various traffic to the project site (visitors, workers, maintenance workers, etc.) at 3,905,278 VMT per year. This figure was used to calculate annual fuel usage.

In addition to the direct and indirect emissions created from project construction and operation, the project's renewable electricity generation would create an indirect emissions reduction of GHGs. The project would implement measures to further reduce energy consumption, such as enhanced daylighting, rainwater collection leading to bioswales, a sloped green roof, and rooftop solar photovoltaic panels. However, the energy analysis presented in this report conservatively does not take credit for the reduction in energy usage due to implementation of these sustainability features. By including these features, the project avoids wasteful, inefficient, or unnecessary consumption of fuel or energy.

5.1.2.1 BUILDING AND FACILITY ENERGY USE

The new buildings and facilities would incorporate sustainability design features such as enhanced daylighting, rainwater collection leading to bioswales, a sloped green roof, and rooftop solar photovoltaic panels. However, the energy analysis presented in this report conservatively does not take credit for the reduction in energy usage due to implementation of these sustainability features.

5.1.2.2 WATER SUPPLY, TREATMENT, AND DISTRIBUTION ENERGY USE

Additional electricity use is required to supply, treat, and distribute potable water and to treat the resulting wastewater. Site-level water usage was based on CalEEMod defaults for all land uses that make up the

project site. This is a conservative assumption as it does not take into account the installation of water-efficient appliances and drought-tolerant landscaping. Electricity usage rates for the supply and treatment of water were calculated using CalEEMod default factors.

5.1.2.3 MOBILE ENERGY USE

Mobile fuel usage for the project is detailed in Appendix A. Gasoline, diesel, natural gas, and electricity use rates were calculated based on CalEEMod default trip rates, default trip lengths, and fuel efficiency rates derived from EMFAC and the U.S. Department of Energy. Fuel efficiency for gasoline, diesel, and natural gas–fueled vehicles was calculated from EMFAC daily VMT and fuel consumption data, averaged across all vehicle categories for operations.

5.1.2.4 STATIONARY AND OFF-ROAD EQUIPMENT ENERGY USE

Three emergency generators and one forklift are included as part of the project operations.
The emergency generator and forklift diesel use for the project is calculated in Appendix A. Annual fuel usage was calculated based on fuel consumption rates (in gallons per hour) and annual operating hours.

5.2 Construction

During project construction, energy would be consumed in the form of electricity on a limited basis for powering lights, electronic equipment, and for water conveyance for dust control. Project construction would also consume energy in the form of petroleum-based fuels associated with the use of off-road construction vehicles and equipment on the project site, construction workers traveling to and from the project site, and delivery and haul truck trips (e.g., hauling of demolition material to off-site reuse and disposal facilities).

Table 2 provides a summary of the annual average electricity, gasoline fuel, and diesel fuel estimated to be consumed during project construction. As shown in Table 2, a total of 142,095 gallons of gasoline and 272,696 gallons of diesel is estimated to be consumed during project construction. Appendix A provides additional calculation details.

Table 2. Total Construction-Related Fuel Consumption

Diesel		
On-Road Construction Trips*	58,522	gallons
Off-Road Construction Equipment†	214,174	gallons
Diesel Total	***272,696***	***gallons***
Gasoline		
On-Road Construction Trips*	142,095	gallons
Off-Road Construction Equipment‡	0	gallons
Gasoline Total	***142,095***	***gallons***
Total	**414,791**	**gallons**

* On-road mobile source fuel use based on VMT from CalEEMod for construction and fleet-average fuel consumption in gallons per mile from EMFAC web-based data for South Coast Air Basin.

† Off-road mobile source fuel usage based on a fuel usage rate of 0.05 gallon of diesel per horsepower (HP)-hour, based on South Coast Air Quality Management District CEQA Air Quality Handbook, Table A9 -3E.

‡ All emissions from off-road construction equipment were assumed to be diesel.

Each of these is discussed and analyzed in greater detail in the sections below. As specified earlier, these figures represent a highly conservative estimate, in that it assumes the maximum volume of on-road and off-road construction equipment usage every day for each phase of construction.

5.2.1 Electricity

During construction of the project, electricity would be consumed, on a limited basis, to power lighting, electric equipment, and supply and convey water for dust control and for an on-site construction trailer. Electricity would be supplied to the project site by LADWP and would be obtained from the existing electrical lines that connect to the project site. The electricity demand at any given time would vary throughout the construction period based on the construction activities being performed and would cease upon completion of construction. Electricity use from construction would be short term, limited to working hours, used for necessary construction-related activities, and would represent a small fraction of the project's net annual operational electricity. When not in use, electric equipment would be powered off so as to avoid unnecessary energy consumption. Furthermore, the electricity used for off-road light construction equipment would have the co-benefit of reducing construction-related air pollutant and GHG emissions from more traditional construction-related energy in the form of diesel fuel. Therefore, impacts from construction electrical demand would be less than significant and would not result in the wasteful, inefficient, and unnecessary consumption of energy.

5.2.2 Natural Gas

As stated above, construction activities, including the construction of new buildings and facilities, typically do not involve the consumption of natural gas. Accordingly, natural gas would not be supplied to support project construction activities; thus, there would be no expected demand generated by construction of the project. Therefore, the project would result in no impacts from construction natural gas demand and would not result in the wasteful, inefficient, and unnecessary consumption of energy.

5.2.3 Transportation Energy

During project construction, on- and off-road vehicles would consume an estimated annual average of approximately 142,095 gallons of gasoline and 272,696 gallons of diesel. Project construction activities would last for approximately 4 years. Construction of the project would use fuel-efficient equipment consistent with state and federal regulations, such as fuel efficiency regulations in accordance with the CARB Pavley Phase II standards, the anti-idling regulation in accordance with Section 2485 in 13 CCR, and fuel requirements in accordance with 17 CCR Section 93115. The project would benefit from fuel and automotive manufacturers' compliance with CAFE standards, which would result in more efficient use of transportation fuels (lower consumption). As such, the project would indirectly comply with regulatory measures to reduce the inefficient, wasteful, and unnecessary consumption of energy, such as petroleum-based transportation fuels. While these regulations are intended to reduce construction emissions, compliance with the anti-idling and emissions regulations discussed above would also result in fuel savings from the use of more fuel-efficient engines.

In addition, the project would divert mixed construction and demolition debris to City-certified construction and demolition waste processors using City-certified waste haulers, consistent with the Los Angeles City Council approved Ordinance No. 181519 (LAMC Chapter VI, Article 6, Section 66.32-6.32.5). Diversion of mixed construction and demolition debris would reduce truck trips to landfills, which are typically located some distance away from City centers and would increase the amount of waste recovered (e.g., recycled, reused, etc.) at material recovery facilities, thereby further reducing transportation fuel consumption.

Based on the analysis above, construction would use energy only for necessary on-site activities and to transport construction materials and demolition debris to and from the project site. As discussed above, idling restrictions and the use of cleaner, energy efficient equipment and fuels would result in less fuel combustion and energy consumption, and thus minimize the project's construction-related energy use. Therefore, construction of the project would not result in the wasteful, inefficient, and unnecessary consumption of energy.

5.3 Operations

During operation of the project, energy would be consumed for multiple purposes, including, but not limited to, HVAC, refrigeration, lighting, and the use of electronics, equipment, and machinery. Energy would also be consumed during project operations related to water usage, solid waste disposal, and vehicle trips. Development of the project would result in an annual estimated energy demand of 1,082,928 kWh per year and require 155,576 gallons of gasoline and 4,493 gallons of diesel per year (Table 3). Appendix A provided additional calculation details.

Table 3. Total Operations-Related Energy Consumption

Fuel Type	Energy Consumption	Units
Electricity		
Building*	1,026,740	kWh/year
Parking Lot*	19,372	kWh/year
Water†	36,816	kWh/year
Total Electricity	**1,082,928**	kWh/year
Natural Gas		
Building*	**3,745,669**	kBTU/year
Mobile‡		
Gasoline	155,576	gallons/year
Diesel	3,175	gallons/year
Equipment§		
Diesel	1,318	gallons/year
Total Gallons Diesel	**4,493**	gallons/year
Total Gallons Gasoline	**155,576**	gallons/year

* Building electricity and parking lot electricity and natural gas use provided by CalEEMod defaults.

† Calculated based on the project's annual water consumption using CalEEMod South Coast Air Quality Management District energy intensity of 0.0111 kWh per gallon for indoor water and 0.009727 kWh per gallon for outdoor water.

‡ Mobile source fuel use based on annual VMT from CalEEMod output and fleet-average fuel consumption in gallons per mile from EMFAC web-based data in South Coast Air Basin.

§ Stationary and off-road operational equipment is based on CalEEMod equipment assumptions to calculate total gallons of diesel fuel.

kWh = kilowatt hours
kBTU = thousand British Thermal Units

The project would be designed to meet the State and County green building requirements and include the installation of additional features to reduce energy use throughout the buildings. The project includes the incorporation of several energy efficient features to the Page Museum. The features include enhanced daylighting, rainwater collection leading to bioswales, a sloped green roof, and incorporation of rooftop solar photovoltaic panels onto the buildings, where possible.[2] Daylighting is the controlled admission of natural light, direct sunlight, and diffused-skylight into a building to reduce electric lighting and save energy. By providing a direct link to the dynamic and perpetually evolving patterns of outdoor illumination, daylighting helps create a visually stimulating and productive environment for building occupants, while reducing as much as one-third of total building energy costs. Water conservation measures could include the use of drought-tolerant planting, installation of dual plumbing in order to use reclaimed water for toilet flushing, use of restaurant faucets of a self-closing design, and stormwater retention through a biofiltration flow-through system to treat the first flush of stormwater runoff before it is captured in belowgrade cisterns, and used on-site for toilets, urinals, landscape irrigation. These features would further maximum energy efficiency. The project's estimated demand for natural gas has been determined by CalEEMod defaults and is considered conservative.

The project's annual net new operational energy demand for electricity, natural gas, and gasoline and diesel transportation fuels is summarized below.

5.3.1 Electricity

With compliance with Title 24 standards and applicable CALGreen requirements, at buildout, the project would result in a projected net increase in the on-site annual demand for electricity totaling 1,082,928 kWh for the project (see Table 3). The project would include energy-saving measures, including natural light to be harvested for the main spaces using large expanses of glass and skylights; daylighting systems to coordinate the levels of artificial lighting; HVAC systems that would be sized and designed in compliance with the CALGreen Code to maximize energy efficiency caused by heat loss and heat gain; and new and existing tree canopies to be used to protect building walls from sun exposure and provide shade for the ground area. These measures were generally accounted for based on compliance with Title 24 standards. In addition to compliance with CALGreen, the project would also incorporate rooftop solar photovoltaic panels onto the buildings, where possible.

Further, it is important to note that the total net project energy demand shown in Table 3 does not reflect the fact that project operational-related energy would likely be lower, as the project would provide sustainability features that would reduce the project's indoor and outdoor water demand. These measures include rainwater collection leading to bioswales and drought-tolerant landscaping, resulting in a reduction in water demand and less use of pesticides. These measures were conservatively not accounted for since a specific outdoor water reduction value could not conclusively be calculated.

In addition, LADWP was required to procure at least 33% of its energy portfolio from renewable sources by 2020 (LADWP has met this requirement as discussed below). With the passage of SB 100 in September 2018, LADWP will be required to update its long-term plans to demonstrate compliance, including providing 60% of its energy portfolio from renewable sources by December 31, 2030, and ultimately planning for 100% eligible renewable energy resources and zero-carbon resources by December 31, 2045. LADWP's current sources include biomass and biowaste, geothermal, eligible hydroelectric, solar, and wind sources. These sources accounted for 35% of LADWP's overall energy mix

[2] At this stage of the design process, it is undetermined whether it will be feasible to incorporate solar panels on both the new museum building and the existing Page Museum. To the extent it is practicable within other limitations (e.g., existing structural and historic considerations), solar panels would be incorporated.

in 2021, the most recent year for which data are available, and represent the available off-site renewable sources of energy that would meet the project's energy demand.

LADWP generates its load forecast to account for regional economic and population growth based on multiple forms of data from various agencies, including historical sales from the General Accountings Consumption and Earnings report, historical Los Angeles County employment data provided from the State's Economic Development Division, plug-in electric vehicle projections from the CEC account building permits when determining electricity Load Forecasts, solar rooftop installations from the Solar Energy Development Group, electricity price projections from the Financial Services organization, and LADWP program efficiency forecasts. In addition, LADWP considers projected Los Angeles County building permit amounts calculated by the UCLA Anderson School of Management when determining its load forecast and would, therefore, account for the project's electricity demand.

Based on the LADWP 2017 Power Strategic Long-Term Resource Plan, LADWP forecasts that its total energy sales in the 2028–2029 fiscal year (the project's buildout year) will be 24,341 gigawatt hours (GWh) of electricity (LADWP 2017). As such, the project-related annual electricity consumption of 1.13 GWh per year would be less than 0.005% of LADWP's projected sales in 2028. As previously described, the project incorporates a variety of energy and water conservation measures and features to reduce energy usage and minimize energy demand. Therefore, with the incorporation of these measures and features, operation of the project would not result in the wasteful, inefficient, or unnecessary consumption of electricity.

5.3.2 Natural Gas

The project would increase the demand for natural gas resources. With compliance with Title 24 standards and applicable CALGreen requirements, at buildout, the project is projected to generate a net increase in the on-site annual demand for natural gas totaling 3,745,669 cubic feet.

SoCalGas accounts for anticipated regional demand based on various factors, including growth in employment by economic sector, growth in housing and population, and increasingly demanding State goals for reducing GHG emissions. SoCalGas accounts for an increase in employment and housing between 2018 to 2035. The project forecasted annual consumption would fall within SoCalGas' projected consumption for the area and would be consistent with SoCalGas' anticipated regional demand from population or economic growth. As would be the case with electricity, the project would comply with the applicable provisions of Title 24 and the CALGreen Code in effect at the time of building permit issuance to minimize natural gas demand. As such, the project would minimize energy demand. Therefore, with the incorporation of these measures and features, operation of the project would not result in the wasteful, inefficient, or unnecessary consumption of natural gas.

5.3.3 Transportation Energy

During operations, project-related traffic would result in the consumption of petroleum-based fuels related to vehicular travel to and from the project site. A majority of the vehicle fleet that would be used by project visitors and employees would consist of light-duty automobiles and light-duty trucks, which are subject to fuel efficiency standards.

As shown in Table 3, the project's estimated annual net increase in petroleum-based fuel usage would be 155,576 gallons of gasoline and 4,493 gallons of diesel for the project. Based on the CEC's California Retail Fuel Outlet Annual Reporting (CEC 2022b), Los Angeles County consumed 3,559,000,000 gallons of gasoline and 563,265,306 gallons of diesel fuel in 2019.

Transportation fuels (gasoline and diesel) are produced from crude oil, which can be domestic or imported from various regions around the world. Based on current proven reserves, crude oil production would be sufficient to meet over 50 years of worldwide consumption. The project would benefit from fuel and automotive manufacturers' compliance with CAFE standards, which would result in more efficient use of transportation fuels (lower consumption). Project-related vehicle trips would also indirectly benefit from Pavley Standards, which are designed to reduce vehicle GHG emissions by mandating increasingly stringent emissions standards on new vehicles but would also result in fuel savings from more efficient engines in addition to compliance with CAFE standards.

The project would support statewide efforts to improve transportation energy efficiency and reduce transportation energy consumption with respect to private automobiles for the reasons provided below. The project would not conflict with the 2020-2045 RTP/SCS goals and benefits intended to improve mobility and access to diverse destinations, provide better "placemaking," provide more transportation choices, and reduce vehicular demand and associated emissions. The project would support these strategies by creating a community serving recreational development comprising recreational uses (including a museum, park, and cafe) that offer employment and other community-serving opportunities. The project supports the development of a balanced mixed of uses by co-locating complementary land uses on an infill project site that is in close proximity to existing off-site commercial and residential uses, being located within 0.25 of off-site commercial and residential uses, and located within an identified high-quality transit area (HQTA) in a highly walkable area well-served by public transportation (refer to the *Air Quality and Greenhouse Gas Technical Report* [SWCA 2022] for additional information regarding the 2020-2045 RTP/SCS). The project would concentrate recreational and athletic facility uses within an HQTA in an urban infill location in proximity to multiple public transit stops. There would be pedestrian entry gates along the perimeter of the project site that would provide access to the park, museum, and landscaped areas. The project would minimize vehicle trips and VMT by virtue of being in a location that has existing high-quality public transit (with access to existing regional bus and rail service), employment opportunities, restaurants and entertainment, all within walking distance—and by including features that support and encourage increase transit use, pedestrian activity, and other non-vehicular transportation.

Additionally, the project design would provide for the installation of the conduit and panel capacity to accommodate EV charging stations for a minimum of 10% of the parking spaces pursuant to the CALGreen Code. Based on the above, the project would minimize operational transportation fuel demand consistent with state, regional, and city goals. Therefore, operation of the project would not result in the wasteful, inefficient, and unnecessary consumption of energy.

5.4 Conclusion

As demonstrated by the previous analysis, the project would not cause wasteful, inefficient, or unnecessary consumption of energy during construction or operation. The project's energy usage during peak and base periods would also not conflict with electricity, natural gas, and transportation fuel future projections for the region. During operations, the project would comply with and exceed existing minimum energy efficiency requirements, such as the Title 24 standards and CALGreen Code. In summary, the project's energy demands would not significantly affect available energy supplies and would comply with existing energy efficiency standards. Therefore, project impacts related to energy use would be less than significant during construction and operation, and would not cause wasteful, inefficient, and unnecessary consumption of energy.

The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. With respect to truck fleet operators, the EPA and NHSTA have adopted fuel efficiency

standards for medium- and heavy-duty trucks. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles, and are phased in for model years 2014 through 2018 and result in a reduction in fuel consumption from 6% to 23% over the 2010 baseline, depending on the vehicle type. The EPA and NHTSA also adopted the Phase 2 heavy-duty truck standards, which would be phased in from model years 2021 through 2027 and require the phase-in of a 5% to 25% reduction in fuel consumption over the 2017 baseline, depending on the compliance year and vehicle type. The energy modeling for trucks does not take into account specific fuel reductions from these regulations, since they would apply to fleets as they incorporate newer trucks meeting the regulatory standards; however, these regulations would have an overall beneficial effect on reducing fuel consumption from trucks over time as older trucks are replaced with newer models that meet the standards. In addition, construction equipment and trucks are required to comply with CARB regulations regarding heavy-duty truck idling limits of 5 minutes at a location and the phase-in of off-road emission standards that result in an increase in energy savings in the form of reduced fuel consumption from more fuel-efficient engines. Although these regulations are intended to reduce criteria pollutant emissions, compliance with the anti-idling and emissions regulations would also result in the efficient use of construction-related energy.

Project construction activities would not conflict with energy conservation plans and impacts would be less than significant. A detailed discussion of the project's comparison with the applicable actions and strategies in the City's Green New Deal is provided in the *Air Quality and Greenhouse Gas Technical Report* (SWCA 2022). The project is designed in a manner that is consistent with and not in conflict with relevant energy conservation plans that are intended to encourage development that results in the efficient use of energy resources. The project would comply with applicable regulatory requirements for the design of new buildings, including the provisions set forth in the Title 24 standards and CALGreen Code. Electricity and natural gas usage during project operations (see Table 3) would be minimized through incorporation of applicable Title 24 standards and applicable CALGreen requirements. Furthermore, the project incorporates energy-conservation measures beyond regulatory requirements, which includes solar panels that would offset some of its overall energy usage with on-site renewable electricity. The project would also provide sustainability features that would all reduce the project's indoor and outdoor water demand. The project would also be consistent with and not conflict with regional planning strategies that address energy conservation. As part of the approach, the 2020-2045 RTP/SCS focus on reducing fossil fuel use by decreasing VMT, encouraging the reduction of building energy use, and increasing use of renewable sources. The project's design and its location on an infill site within an HQTA in proximity to transit; its proximity to existing off-site retail, restaurant, entertainment, commercial, and job destinations; and its walkable environment would achieve a reduction in VMT.

These land use characteristics are included in the transportation fuel demand for the project's mobile sources. With respect to operational transportation-related fuel usage, the project would support statewide efforts to improve transportation energy efficiency and reduce transportation energy consumption with respect to private automobiles. The project would also benefit from fuel and automotive manufacturers' compliance with CAFE fuel economy standards and the Pavley Standards, which are designed to result in more efficient use of transportation fuels.

As a result, the project would implement project design features and incorporate water conservation, energy conservation, landscaping, and other features consistent with applicable actions and strategies in the City's Green New Deal. The project's design would comply with existing energy standards and incorporate project design features to reduce energy consumption. Therefore, the project would not conflict with energy conservation plans and impacts would be less than significant.

6 CUMULATIVE IMPACTS

Cumulative impacts occur when the incremental effects of a proposed project are significant when combined with similar impacts from other past, present, or reasonably foreseeable projects in a similar geographic area. The geographic context for the analysis of cumulative impacts on electricity is LADWP's service area, and the geographic context for the analysis of cumulative impacts on natural gas in SoCalGas' service area, because the project and related projects are located within the service boundaries of LADWP and SoCalGas. While the geographic context for transportation-related energy use is more difficult to define, the City has determined to consider the project in the context of countywide consumption, given the tendency for vehicles to travel within and through the county and the availability of county-level data. Growth within these geographies is anticipated to increase the demand for electricity, natural gas, and transportation energy, as well as the need for energy infrastructure, such as new or expanded energy facilities.

6.1 Electricity

Buildout of the project, related projects, and additional forecasted growth in LADWP's service area would cumulatively increase the demand for electricity supplies and on infrastructure capacity. However, LADWP, in coordination with the CEC, accounts for future increases in service area demand based on various economic, population, and efficiency factors. LADWP relies on multiple forms of data from various agencies, including historical sales from the General Accountings Consumption and Earnings report, historical Los Angeles County employment data provided from the State's Economic Development Division, plug-in electric vehicle projections from the CEC account building permits when determining electricity Load Forecasts, solar rooftop installations from the Solar Energy Development Group, electricity price projections from the Financial Services organization, and LADWP program efficiency forecasts. As described in LADWP's 2017 Power Strategic Long-Term Resource Plan, LADWP would continue to expand delivery capacity as needed to meet demand increases within its service area at the lowest cost and risk consistent with LADWP's environmental priorities and reliability standards. The 2017 Power Strategic Long-Term Resource Plan takes into account future energy demand, advances in renewable energy resources and technology, energy efficiency, conservation, and forecast changes in regulatory requirements. Accordingly, LADWP considers projected Los Angeles County building permit amounts calculated by the UCLA Anderson School of Management when determining its load forecast and would, therefore, account for the project's and the related projects' electricity demand within its forecasts. Thus, LADWP considers growth from related projects within its service area for the increase in demand for electricity, as well as the need for energy infrastructure, such as new or expanded energy facilities.

Although project development would result in the use of renewable and nonrenewable electricity resources during construction and operation, which could affect future availability, the project's use of such resources would be on a relatively small scale and would be reduced by measures rendering the project more energy efficient. Related projects, as with the project, would be required to evaluate energy impacts during construction and operation related to the wasteful, inefficient, or unnecessary use of electricity, incorporate energy conservation features, comply with applicable regulations including the City's Green Building Code, the Title 24 standards and CALGreen Code, and incorporate mitigation measures, as necessary under CEQA. Related projects, as with the project, would also be required to evaluate potential impacts related to local and regional supplies or capacity based on regional growth plans, such as the SCAG 2020-2045 RTP/SCS, and LADWP energy supply projections for long-term planning. Each of the related projects would be reviewed by the local utility provider to identify necessary electricity service connections to meet the needs of their respective projects. In addition, the local utility provider would provide service letters (which take into account all current uses and projected future development projects) for each related project, confirming availability of adequate electricity

supplies and infrastructure as part of the total load growth of the regional power system. Project applicants would be required to provide for the needs of their individual projects, thereby contributing to the electrical infrastructure in the project site area.

Additionally, LADWP was required to procure a minimum of 33% of its energy portfolio from eligible renewables sources by 2020, which LADWP has achieved. LADWP's current sources of renewable energy include biomass and biowaste, geothermal, eligible hydroelectric, solar and wind, and accounted for 34% of LADWP's overall energy mix, the most recent year for which data are available. This represents the available off-site renewable sources of energy that could meet the project's and related projects' energy demand. Therefore, the project and related projects would comply with the energy conservation plans and efficiency standards required to ensure efficient energy use.

Therefore, the project's impact, when considered together with related projects, would not be cumulatively considerable and would not result in cumulatively significant impacts related to wasteful, inefficient, or unnecessary use of electricity.

6.2 Natural Gas

Buildout of the project, related projects, and additional forecasted growth in SoCalGas' service area would cumulatively increase the demand for natural gas supplies and on infrastructure capacity. SoCalGas forecasts consider projected population growth and development based on local and regional plans, and the project's growth and development would not conflict with those projections. Additionally, as with the project, each of the related projects would be reviewed by SoCalGas to identify necessary natural gas service connections to meet the needs of their respective projects, and SoCalGas would provide service letters for each related project confirming availability of adequate natural gas supplies as part of the total load growth of the regional natural gas system. Natural gas infrastructure is expanded and improved in response to increasing demand and it is expected that SoCalGas would continue to expand delivery capacity if necessary to meet growth requirements in the service area. Although project development would result in the use of natural gas resources, which could limit future availability, the use of such resources would be on a relatively small scale, would be reduced by measures rendering the project more energy-efficient, would be consistent with regional and local growth expectations for SoCalGas' service area, and would not result in the need to construct new or expand existing natural gas facilities or distribution lines.

Related projects, as with the project, would be required to evaluate natural gas impacts during construction and operation related to the wasteful, inefficient, or unnecessary use of natural gas, incorporate energy conservation features, comply with applicable regulations including the Los Angeles Green Building Code, the Title 24 standards and CALGreen Code, and incorporate mitigation measures, as necessary under CEQA. As with the project, related projects would also be required to obtain evidence of service from SoCalGas, or the appropriate utility provider, to ensure that natural gas service would be available and provided to meet related project demands. Furthermore, the related projects are generally infill projects in a highly urbanized area already served by existing facilities and are generally residential, mixed-use, and commercial projects, and not high-energy-demand facilities, such as heavy industrial uses.

Therefore, the project's contribution to cumulative impacts due to wasteful, inefficient, and unnecessary use of natural gas would not be cumulatively considerable, and, thus, cumulative impacts would be less than significant.

6.3 Transportation Energy

Buildout of the project, related projects, and additional forecasted growth would cumulatively increase the demand for transportation-related fuel in the state and region. As described above, at buildout, the project would consume a total net increase of 155,576 gallons of gasoline and 4,493 gallons of diesel per year.

Additionally, petroleum currently accounts for 90% of California's transportation energy sources; however, over the last decade, the State has implemented several policies, rules, and regulations to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and GHGs from the transportation sector, and reduce VMT, which would reduce reliance on petroleum fuels.

The project would not conflict with the energy efficiency policies emphasized by the 2020-2045 RTP/SCS. As discussed previously, the project would be consistent with and not conflict with SCAG's land use type for the area and would encourage alternative transportation and a reduction in overall VMT. The project site is an infill location close to jobs, off-site housing, shopping, and entertainment uses and is in close proximity to existing public transit stops, which would result in reduced VMT, as compared to a project of similar size and land uses at a location without close and walkable access to off-site destinations and public transit stops. The project would concentrate recreational and athletic facility uses within an HQTA in an urban infill location in proximity to multiple public transit stops. Therefore, operation of the project would provide visitors and employees with transportation options, and the implementation of construction features would reduce idling times and construction transportation fuel use.

The 2020-2045 RTP/SCS is a regional planning tool that addresses cumulative growth and resulting environmental effects and is applicable to the project and related projects with respect to transportation energy efficiency. Related projects would be required under CEQA to evaluate if their respective developments would conflict with the energy efficiency policies emphasized by the 2020-2045 RTP/SCS, such as the per-capita VMT targets, promotion of alternative forms of transportation, proximity to public transportation options, and provisions for encouraging multi-modal and energy efficient transit, such as by accommodating bicycle parking and EV chargers at or above regulatory requirements.

Furthermore, as with the project, the related projects within the project vicinity and HQTA would similarly be expected to reduce VMT by encouraging the use of alternative modes of transportation and other design features that promote VMT reductions that would not be in conflict with applicable provisions of the SCAG 2020-2045 RTP/SCS for the land use type.

Since the project would not conflict with the 2020-2045 RTP/SCS, the project's contribution to cumulative impacts due to wasteful, inefficient, or unnecessary use of transportation fuel would not be cumulatively considerable, and, thus, cumulative impacts would be less than significant.

6.4 Conclusion

Based on the analysis provided above, the project's contribution to cumulative impacts related to energy consumption (i.e., electricity, natural gas, and transportation energy) would not result in a cumulatively considerable effect related to potentially significant environmental impacts due to the wasteful, inefficient, and unnecessary consumption of energy during construction or operation. Therefore, the project's cumulative energy impacts would be less than significant.

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APPENDIX A

Fuel Usage and Energy Calculations

Total Construction-Related Fuel Consumption

Diesel		
On-Road Construction Trips[1]	58,522	Gallons
Off-Road Construction Equipment[2]	214,174	Gallons
Diesel Total	**272,696**	**Gallons**
Gasoline		
On-Road Construction Trips[1]	142,095	Gallons
Off-Road Construction Equipment[3]	-	Gallons
Gasoline Total	**142,095**	**Gallons**
Total	**414,791**	**Gallons**

Notes:
1. On-road mobile source fuel use based on vehicle miles traveled (VMT) from CalEEMod for construction and fleet-average fuel consumption in gallons per mile from EMFAC web based data for the South Coast Air Basin to ensure a conservative analysis.
2. Off-road mobile source fuel usage based on a fuel usage rate of 0.05 gallons of diesel per horsepower (HP)-hour, based on SCAQMD CEQA Air Quality Handbook, Table A9 -3E.
3. All emissions from off-road construction equipment were assumed to be diesel.

On-Road Construction Trip Estimates

Trip Type	Trips	Trip length	Vehicle Miles Traveled (VMT)	Fuel Efficiency	Annual Fuel Usage[1]	
	(trips)	(miles)	(miles)	(mpg)	(Fuel)	(gallon)
Worker[2,3]	188,180	18.5	3,481,330	24.5	Gasoline	142,095
Vendor[4]	17,160	10.2	175,032	6.9	Diesel	25,367
Hauling[5]	11,356	20	227,120	6.9	Diesel	32,916
Onsite Truck[6]	1,647	1.00	1,647	6.9	Diesel	239

Notes:
1. On-road mobile source fuel use based on vehicle miles traveled (VMT) from CalEEMod output for all years of construction and fleet-average fuel consumption in gallons per mile from EMFAC web based data in the South Coast Air Basin.
2. Worker trips were assumed to be 100% gasoline powered vehicles.
3. Per CalEEMod, worker Trips were assumed to be 50% LDA, 25% LDT1, and 25% LDT2.
4. Vendor trips were assumed to be 50% MHDT and 50% HHDT, split evenly between the MHDT and HHDT construction categories.
5. Per CalEEMod, hauling trips were assumed to be 100% HHDT. 6. Per CalEEMod, onsite truck trips were assumed to be 100% HHDT.

Calculation of Diesel Usage During Construction (Off-Road Equipment)								
Phase Name	**Off-Road Equipment Type**	**Units**	**Hours**	**HP**	**Load Factor**	**Avg. Daily Factor**	**Number of Days**	**Diesel Fuel Usage**
Demolition	Rubber Tired Dozers	2	8	367	0.4	1	262	30,769.28
Demolition	Excavators	3	8	36	0.38	1	262	4,300.99
Demolition	Concrete/Industrial Saw	1	8	33	0.73	1	262	2,524.63
Site Preparation	Rubber Tired Dozers	3	8	367	0.4	1	262	46,153.92
Site Preparation	Tractors/Loaders/Backhoes	4	8	84	0.37	1	262	13,028.74
Grading	Graders	1	8	148	0.41	1	52	1,262.14
Grading	Excavators	2	8	36	0.38	1	52	569.09
Grading	Tractors/Loaders/Backhoes	2	8	84	0.37	1	52	1,292.93
Grading	Scrapers	2	8	423	0.48	1	52	8,446.46
Grading	Rubber Tired Dozers	1	8	367	0.4	1	52	3,053.44
Building Construction	Aerial Lifts	3	8	82	0.2	1	808	15,901.44
Building Construction	Bore/Drill Rigs	1	8	14	0.74	1	808	3,348.35
Building Construction	Cranes	1	8	367	0.29	1	808	34,398.18
Building Construction	Forklifts	1	8	46	0.45	1	808	6,690.24
Building Construction	Generator Sets	3	8	84	0.37	1	808	30,135.17
Paving	Pavers	2	8	81	0.42	1	184	5,007.74
Paving	Paving Equipment	2	8	89	0.36	1	184	4,716.29
Paving	Rollers	2	8	36	0.38	1	184	2,013.70
Architectural Coating	Air Compressors	1	8	37	0.48	1	79	561.22
							Total Diesel Usage for Construction (Offroad Equipment):	**214,173.94**

gallons of diesel fuel per horsepower hour= 0.05

Notes: Equipment assumptions are provide in the CalEEMod output files and fuel usage estimate of 0.05 gallons of diesel fuel per horsepower-hour is from the SCAQMD CEQA Ait Quality Handbook, Table A9-3E

Annual Calculation of Diesel Usage During Construction (Off-Road Equipment)		
Year	**Construction Phases**	**Total Diesel Usage for Construction (Offroad Equipment):**
2024	Demolition; Site Preparation; Grading	111401.624
2025	Building Construction	40869.78
2026	Building Construction; Architectural Coating	41430.996
2027	Building Construction; Paving	20471.544

Annual Energy Consumption from Operation		
Fuel Type	**Energy Consumption**	**Units**
Electricity		
Buildings[1]	1,026,740	kWh/year
Parking Lot[1]	19,372	kWh/year
Water[2]	36,816	kWh/year
Total Electricity	**1,082,928**	kWh/year
Natural Gas		
Buildings[1]	3,745,669	kBTU/year
Mobile[3]		
Gasoline	155,576	gallons/year
Diesel	3,175	gallons/year
Equipment[4]		
Diesel	1,318	gallons/year
Total Gallons Diesel	**4,493**	gallons/year
Total Gallons Gasoline	**155,576**	gallons/year

Notes:
1. Building electricity and parking lot electricity and natural gas use provided by CalEEMod defaults.
2. Calculated based on the Project's annual water consumption using CalEEMod SCAQMD energy intensity of 0.0111 kWhr per gallon for indoor water and 0.009727 kWhr per gallon for outdoor water.
3. Mobile source fuel use based on annual vehicle miles traveled (VMT) from CalEEMod output and fleet-average fuel consumption in gallons per mile from EMFAC web-based data in South Coast Air Basin.
4. Stationary and off-road operational equipment is based on CalEEMod equipment assumptions to calculate total gallons of diesel fuel.

On-Road Operations Trip Estimates				
Trip Type	**Vehicle Miles Traveled (VMT)**	**Fuel Efficiency**	**Annual Fuel Usage[1]**	
	(miles per year)	**(mpg)**	**(Fuel)**	**(gallon)**
Weekday	2,851,680	24.6	Gasoline/Diesel	115,922
Saturday	617,474	24.6	Gasoline/Diesel	25,101
Sunday	436,125	24.6	Gasoline/Diesel	17,729

Notes:
1. Mobile source fuel use based on annual vehicle miles traveled (VMT) from CalEEMod output and fleet-average fuel consumption in gallons per mile from EMFAC web based data in South Coast Air Basin.

Calculation of Diesel Equipment Usage During Operations								
Phase Name	**Equipment Type**	**Units**	**Hours**	**HP**	**Load Factor**	**Daily Factor**	**Number of Days**	**Diesel Fuel Usage**
Operations	Forklifts	1	4	82	0.2	1	260	852.80
Operations	Generator Sets	3	2	85	0.73	1	25	465.38

APPENDIX M

Resumes of Key EIR Personnel

BOBBETTE BIDDULPH, B.S., SENIOR ENVIRONMENTAL PLANNER

Ms. Biddulph is an environmental consultant with a diverse professional background throughout California. She has a deep knowledge of the California Environmental Quality Act (CEQA). Ms. Biddulph balances competing objectives throughout the planning process, providing clients sophisticated insight and guidance to inform decision-making. Ms. Biddulph's experience with planning, environmental documentation, and compliance spans a myriad of project types, from the small and focused to the large, complex, and controversial. She specializes in the management of large multidisciplinary environmental contracts and projects. With a degree in City and Regional Planning, Ms. Biddulph's academic training provides a necessary foundation to provide a range of services to public and private clients.

SELECTED PROJECT EXPERIENCE (∗ denotes project experience prior to SWCA)

YEARS OF EXPERIENCE

28

EXPERTISE

CEQA Compliance

Project Management

City and Regional Planning

Entitlement Processing and Permitting

EDUCATION

B.S., City and Regional Planning; California Polytechnic State University, San Luis Obispo; 1992

AWARDS / HONORS

PG&E Topock Compressor Station Soil Investigation Project Final EIR, Merit Award, AEP

North Torrey Pines Bridge Seismic Retrofit, Best Available Environmental Technology, first place, NAEP

Caltrans District 11 Headquarters EIR, Award of Excellence, ASCE

Milpitas Midtown Specific Plan and EIR; first place, Small Jurisdiction, Northern Section APA

Tuolumne River Regional Park Master Plan and EIR; Outstanding Environmental Resource Document, Large Jurisdiction, second place, AEP

MEMBERSHIPS

Member, Association of Environmental Professionals

La Brea Tar Pits Master Plan EIR; Los Angeles County Natural History Museum; Los Angeles County, California. SWCA is preparing an EIR addressing the environmental impacts of significant improvements to this iconic site in central Los Angeles. Significant development has occurred in the project vicinity in recent years (e.g., at the adjacent LA County Museum of Art and with the LA Metro), and the EIR and approach to construction phasing will be highly scrutinized. In addition to leading the EIR process, SWCA is assisting with the public engagement process. The conceptual master plan was recently developed by the Natural History Museum for the future development and enhancement of the La Brea Tar Pits site. The master plan includes the existing museum and Hancock Park and seeks to unify the critical research sites, buildings, exhibition space, and the park with an inspiring new identity. *Role: Senior Project Manager.*

As-Needed Environmental Assessment and Air Quality Services; Los Angeles Department of Water and Power (LADWP); Los Angeles, California. Providing as-needed consultant environmental consultant support, including specialized monitoring and technical studies for the maintenance and development of water and power facilities. *Role: Contract Manager.*

Pacific Industrial IS/MND; City of Santa Clarita; Los Angeles County, California. SWCA is preparing the IS/MND for the proposed Pacific Industrial Warehouse project. The IS/MND evaluates the environmental effects of the project, which includes the construction and operation of a 174,000-square-foot industrial warehouse building and associated site improvements on a 12.84-acre property. In addition, SWCA provided technical peer reviews of the Applicant-prepared technical reports, including biological resources and cultural resources. SWCA is managing potential stakeholder concerns through close coordination with the City and clearly addressing the areas of controversy through the environmental document. *Role: Project Manager.*

City of San Luis Obispo As-Needed Planning and Environmental Services Contract; City of San Luis Obispo; San Luis Obispo County, California. SWCA holds an as-needed environmental and CEQA services contract with the City of San Luis Obispo. SWCA supplements City of San Luis Obispo staff by providing full-service planning and environmental review services for specific plans and amendments, general plan and zoning amendments, and development projects, including commercial, redevelopment, and residential projects. *Role: Project Manager/Environmental Planner.*

East Niles Community Services District; MKN Associates; Kern County, California. SWCA has been assisting MKN Associates with CEQA compliance for many public water utility projects, including construction of pipelines, new water tanks and pump stations, and filtration systems. *Role: Project and Contract Manager.*

*Santa Susana Field Laboratory EIR; California Department of Toxic Substances Control; Ventura County, California. The Santa Susana Field Laboratory is a former rocket engine test, nuclear, and liquid metals research facility located on a 2,849-acre site in the Simi Hills. The use of hazardous substances at the field laboratory such as trichloroethylene and other solvents, heavy metals, and radioactive material has resulted in soil and/or groundwater contamination. The field laboratory is currently the focus of a comprehensive environmental investigation and cleanup program, conducted by Boeing, the United States Department of Energy and the National Aeronautics and Space Administration, and overseen by the Department of Toxic Substances Control. *Role: Senior CEQA Specialist.*

*Riverside County State Vehicular Recreation Area Planning and Environmental Studies; County of Riverside and State Department of Parks and Recreation and Riverside County; Riverside County, California. Ms. Biddulph worked with the County of Riverside and the State Parks in planning for a state vehicular recreation area for OHV and multiuse trails. The project included a comprehensive advisory committee and community involvement process, which addressed the interests of the local environmental community, City of Beaumont, CDFG, USFWS, County of Riverside, State Parks, and members of the OHV community. *Role: Project Manager.*

*As-Needed CEQA Support, Resource Monitoring and Biological Restoration Services Contract; County of San Diego Department of Parks and Recreation; California. On-call services for task orders related to development of County park facilities and trails. These projects included a range of tasks including biological and cultural resources inventory surveys, long-term species monitoring, vegetation management and public access plans, and CEQA documents for recreational projects. *Principal-in-charge and Senior CEQA Lead.*

*Encinitas Hall Property Community Park EIR; City of Encinitas; Encinitas, California. The Hall Property Community Park was proposed and developed by the City of Encinitas on a 43-acre site adjacent to Interstate 5. The park includes two full-sized baseball fields and a third smaller baseball field in the southern portion of the project site. Lighting was proposed and ultimately developed for the baseball fields to facilitate nighttime play. The park also provides soccer fields, an aquatic center, skate park, teen center, dog park, and additional recreation facilities for varied experiences. The environmental process was highly scrutinized by the community, due to the prominence of the project and adjacency issues that result from nearby single-family residential uses. Because the detailed engineering and design of the park was not yet developed at the time of CEQA analysis, the EIR provided a flexible and performance-based approach to many of the potential environmental issues. The EIR withstood challenge in court. *Role: Ms. Biddulph led the preparation of the technical studies and the EIR for this landmark City project.*

*Owens Lake Master Project EIR; City of Los Angeles Department of Water and Power; Inyo County, California. Owens Lake has been known as the largest source of particulate-matter pollution in the United States because of historic water diversions from Owens Valley. To address dust control and public values, the Los Angeles Department of Water and Power initiated a stakeholder-driven process to define an integrated land use, resource management, and public use vision that will result in a Master Project to manage and enhance Owens Lake. To be ratified as the vision for Owens Lake, the Master Project must be adopted by the California State Lands Commission and evaluated under CEQA and the Public Trust doctrine. *Role: Project Director.*

*Oceanside Coast Highway Corridor Study and EIR; City of Oceanside; Oceanside, California. This project was managed jointly by the Oceanside Planning and Engineering departments between 2016 and 2019. In 2009, the City adopted the Coast Highway Vision and Strategic Plan, which calls for complete street improvements and zoning incentives to create a vibrant, pedestrian-oriented mixed-use environment within the Coast Highway corridor. As part of the effort to implement the Vision Plan, the City initiated the Coast Highway Corridor Study, which included a program EIR that considers potential environmental impacts associated with complete street improvements and optional zoning standards. The project established a preferred “Road Diet” alternative and an implementation plan to achieve it. The EIR was a hybrid EIR, analyzing the zoning standards at a program-level and providing more detailed review of the public right-of-way improvements. *Role: Project Manager.*

JOHN DIETLER, PH.D., RPA, PRINCIPAL-IN-CHARGE

Dr. Dietler is the Vice President of the Southern California and Pacific Islands subregion, as well as a cultural resources Principal Investigator. He serves as principal-in-charge of large, multidisciplinary, and on-call contracts for major municipalities, utilities, and federal departments., ensuring the timely delivery of high quality, legally compliant CEQA and cultural, natural, and paleontological resources analyses. As a cultural resources subject matter expert, Dr. Dietler is responsible for creating innovative research, mentoring staff, and providing QA/QC for technical studies. He has conducted extensive archaeological research in support of development, infrastructure, and multidisciplinary environmental projects in compliance with CEQA and Section 106 of the National Historic Preservation Act. A versatile consultant who has supervised research projects of all sizes and descriptions, Dr. Dietler has served as subject matter expert for over 150 projects throughout the west. He has managed large on-call contracts with His extensive experience enables him to produce legally compliant, industry-leading research within limited budgets and timeframes.

YEARS OF EXPERIENCE

27

EXPERTISE

Contract management

Cultural resources management

California history and archaeology

Historic preservation

NHPA Section 106 and 110

CEQA/NEPA

Native American and NAGPRA Consultation

EDUCATION

Ph.D., Anthropology, e: Archaeology; University of California - Los Angeles; 2008

M.A., Anthropology, e: Archaeology; University of California - Los Angeles; 2003

B.A. magna cum laude, Anthropology, e: Archaeology, m: Geology; George Washington University, Washington D.C.; 1996

REGISTRATIONS / CERTIFICATIONS

Registered Prof. Archaeologist No. 15224; 2003

Exceeds the U.S. Secretary of Interior's Professional Qualifications Standards for prehistoric archaeologist

SELECTED PROJECT EXPERIENCE

La Brea Tar Pits Master Plan EIR; Los Angeles County Natural History Museum; Los Angeles County, California. SWCA is preparing an EIR addressing the environmental impacts of significant improvements to this iconic site in central Los Angeles. Significant development has occurred in the project vicinity in recent years (e.g., at the adjacent LA County Museum of Art and with the LA Metro), and the EIR and approach to construction phasing will be highly scrutinized. In addition to leading the EIR process, SWCA is assisting with the public engagement process. The conceptual master plan was recently developed by the Natural History Museum for the future development and enhancement of the La Brea Tar Pits site. The master plan includes the existing museum and Hancock Park and seeks to unify the critical research sites, buildings, exhibition space, and the park with an inspiring new identity. *Role: Senior Principal-in-charge.*

Los Angeles County Natural History Museum Commons Project; Los Angeles County Natural History Museum; Los Angeles, California. SWCA prepared a California Environmental Quality Act (CEQA) Class 32 Infill Exemption for the demolition of the existing Jean Delacour Auditorium, interior improvements, and construction of an addition to the Los Angeles County Natural History Museum. The CEQA analysis included Air Quality, Biology, Archaeology, Architectural History, Paleontology, and Traffic studies. *Role: Principal-in-charge.*

LA Plaza de Cultura y Artes EIR Addendum; LA Plaza Foundation; City and County of Los Angeles, California. Across seven contracts, SWCA provided expert CEQA and cultural resources consultation for the LA Plaza de Cultura y Artes campus, in compliance with state and federal laws including Section 106 of the NHPA, the Native American Graves Protection and Repatriation Act (NAGPRA), NEPA, and CEQA. Services provided to date included archaeological laboratory analysis, treatment and reburial of human remains, historical research, Native American and other interested party consultation, expert witness services, archaeological testing and data recovery, archaeological and Native American monitoring, technical reports, a Historic Properties Management Plan, an update to the Los Angeles Plaza Historic District National Register of Historic Places District nomination, and two Addenda EIR. SWCA provided technical expertise and consultation at the highest level, ensuring compliance and

allowing numerous phases of the project to come to successful conclusions. *Role: Lead Consultant, Principal Investigator, and Project Manager, and Principal-in-charge.*

LA Plaza Cultura Village Project EIR; Terry A. Hayes Associates; Los Angeles County, California. The LA Plaza Cultura Foundation (Foundation) engaged SWCA, via a small business prime, to perform technical analyses supporting an environmental impact report (EIR) under CEQA and appropriate documentation under NEPA to analyze the environmental impacts of the Foundation's proposed development of LA Plaza Cultura Village, an approximately 425,000 square foot mixed-use project located on two County of Los Angeles owned parcels in downtown Los Angeles that had long been surface parking lots. Our cultural resources study identified a large and significant archaeological deposit beneath the parking lots dating from the 1880s, and SWCA prepared a mitigation and monitoring plan to record and mitigate impacts to this important resource. *Role: Project Manager, Principal Investigator.*

SCAG 2020 RTP/SCS Program Environmental Impact Report; Impact Sciences, Inc.; Multiple Counties, California. SWCA was retained by Impact Sciences to provide environmental services in support of the Southern California Association of Governments (SCAG) Program Environmental Impact Report (PEIR) for the 2020 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) (RTP/SCS) in accordance with environmental compliance procedures under federal metropolitan planning law and regulations, the California Environmental Quality Act (CEQA) statutes and guidelines, and other relevant federal and state environmental laws and regulations. SWCA is conducting biological, cultural, and paleontological resources studies in support of the 2020 RTP/SCS PEIR. *Role: Principal Investigator.*

San Bernardino Web-based Countywide General Plan and Environmental Impact Report; PlaceWorks; San Bernardino County, California. SWCA is currently conducting cultural and paleontological resources studies supporting Placeworks in their development of a Web-based Countywide Plan and preparation of a Program EIR for the County of San Bernardino. SWCA is providing Native American consultation support, conducting records searches for cultural and paleontological resources to summarize the existing conditions and inform a sensitivity analysis for the plan area, which includes Community Plan Area within unincorporated portions of San Bernardino County. *Role: Cultural Resources Specialist.*

Valentine Environmental Impact Report; Provost & Pritchard Consulting Group; Kern County, California. SWCA was retained first by Provost & Pritchard Consulting Group, and later directly by EDF RE, to provide biological, cultural, and paleontological resources services in support of the Valentine Solar Project located on 2,000 acres in Kern County, California. SWCA's primary efforts were to provide a Biological Constraints Analysis (BCA) of the project area, which was used to refine the preliminary design of the project. Following preparation of the BCA, SWCA conducted full technical studies for biological, cultural, and paleontological field surveys to support the preparation of an Environmental Impact Report (EIR) and other permitting requirements. Natural resources studies conducted include surveys for nesting birds, burrowing owls, desert tortoise, special-status plants, vegetation communities, and jurisdictional waters. *Role: Cultural Resources Specialist. Managed project and provided research direction and QA/QC for all cultural resources deliverables.*

ACE - San Gabriel Trench; San Gabriel Valley Council of Governments; San Gabriel, Los Angeles County, California. SWCA conducted surveys and technical studies on botanical and wildlife resources and prepared Environmental Impact Report sections for compliance with state and federal statutes, particularly CEQA and NEPA, for review by Caltrans, the lead agency. Over nearly a decade, SWCA conducted a cultural resources project of unmatched scale and complexity. The scope of work included technical studies and prepared Environmental Impact Report sections for compliance with state and federal statutes, particularly CEQA and NEPA, for review by Caltrans, the lead agency. Cultural resources work included archaeological and architectural history surveys and evaluation studies, which were prepared in compliance with Section 106 of the NHPA and Caltrans standards. SWCA oversaw mitigation for adverse effects to the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) listed San Gabriel Mission site. These included a Phase I survey, extended Phase I (XPI) testing, Phase II NRHP evaluation, multiple Phase III archaeological data recoveries, as well as the preparation of HABS and HAER documentation, and the nomination of the mission as a National Historic Landmark.
The project's results were disseminated broadly, including through numerous publications for professional and public audiences.
Role: Principal Investigator. Oversaw all cultural resources work for the project. Senior author or quality control officer for all key planning documents and technical reports.

SHANNON PAGAN, B.A., ENVIRONMENTAL PLANNER

Ms. Pagan is an environmental planner with experience preparing and managing environmental documents for projects subject to compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). She has contributed to a wide range of projects with varying levels of complexity, including authoring numerous sections of environmental impact reports (EIRs) as well as initial studies (ISs) and mitigated negative declarations (MNDs) for agency, utility, and land development clients in California. Ms. Pagan is skilled at providing comprehensive analyses tailored to fit each project.

YEARS OF EXPERIENCE

8

EXPERTISE

CEQA compliance

Environmental planning

Project management assistance

EDUCATION

B.A., Geography; Urban and Regional Analysis Emphasis; San Diego State University; 2007

TRAINING

Advanced CEQA Workshop, Association of Environmental Professionals; March 2022

SELECTED PROJECT EXPERIENCE (∗ denotes project experience prior to SWCA)

La Brea Tar Pits Master Plan EIR; Los Angeles County Natural History Museum; Los Angeles County, California. SWCA is preparing an EIR addressing the environmental impacts of significant improvements to this iconic site in central Los Angeles. Significant development has occurred in the project vicinity in recent years (e.g., at the adjacent LA County Museum of Art and with the LA Metro), and the EIR and approach to construction phasing will be highly scrutinized. In addition to leading the EIR process, SWCA is assisting with the public engagement process. The conceptual master plan was recently developed by the Natural History Museum for the future development and enhancement of the La Brea Tar Pits site. The master plan includes the existing museum and Hancock Park and seeks to unify the critical research sites, buildings, exhibition space, and the park with an inspiring new identity. *Role: Planning Specialist. Primary author for aesthetics, geology and soils; hazards and hazardous materials; hydrology and water quality, land use and planning, recreation, transportation, and project alternatives.*

Richards Ranch EIR; City of Santa Maria; Santa Barbara County, California. SWCA is preparing an EIR for the Richards Ranch project, which includes the annexation of 43.75 acres located within Santa Barbara County into the city of Santa Maria. The project site is currently identified as Key Site 26 in the County of Santa Barbara Orcutt Community Plan. The project proposes a mix of high-density residential uses, retail commercial, and mini-storage. *Role: Planning Specialist. Section author for project description, aesthetics, public services and recreation*, *and project alternatives.*

East Niles Community Services District; MKN Associates; Bakersfield, Kern County, California. SWCA has been assisting MKN Associates with CEQA compliance for many public water utility projects, including construction of new water tanks and pump stations, installation of filtration systems, and pipeline construction. *Role: Planning Specialist. Primary author of IS/MND for the College-Fairfax to Country Club Improvements Project. Coordination of in-house biological resources analysis and determination of compliance with the Metropolitan Bakersfield Habitat Conservation Plan.*

***La Mesa General Plan Program EIR; City of La Mesa; La Mesa, California.** The City of La Mesa prepared a general plan update to strengthen policies that preserve neighborhoods and promote infill development opportunities in the City of La Mesa's commercial areas and along transit corridors. A program EIR was prepared to address the environmental impacts associated with implementing the general plan. *Role: Assistant Project Manager and Section Author. Authored several EIR sections. Provided project budget maintenance, project scheduling, client relations, internal staff coordination, and document delivery.*

***San Marcos General Plan Update and Program EIR; City of San Marcos; San Marcos, California.** The City of San Marcos prepared a comprehensive general plan update to clarify a long-range vision, establish policy guidelines for addressing growth and development, and maintain the desirable qualities of the City of San Marcos. This project involved extensive public outreach and stakeholder coordination to develop a comprehensive update to reflect the vision of the community. Development of the general plan included working closely with the City of San Marcos to update general plan elements and revise and create new goals and policies and implementation

programs. Lastly, a program EIR was prepared to address the environmental impacts associated with implementing the general plan. *Role: Community Outreach Facilitator for all public meetings associated with the general plan development. Coauthor of general plan and Section Author for the EIR.*

*2050 Regional Transportation Plan and Sustainable Communities Strategy EIR; San Diego Association of Governments; San Diego, California. The San Diego Association of Governments prepared the 2050 Regional Transportation Plan and Sustainable Communities Strategy (SC), which provides a plan for investing local, state, and federal transportation funds expected to come into the San Diego region over the next 40 years. The SCS details how the region will reduce greenhouse gas emissions to state-mandated levels over time. The inclusion of the SCS is required by Senate Bill 375, and the San Diego region is the first in California to produce a regional transportation plan with an SCS. The accompanying program EIR prepared for this plan was complex and examined both transportation network improvements and the regional growth and land use changes forecasted. Due to the long-term nature of the plan, future conditions and impact analyses were provided for three target years: 2020, 2035, and 2050. *Role: Assistant Project Manager. Provided project scheduling, client and attorney relations, internal staff coordination, and document delivery at all stages of the project. Reviewed and revised EIR sections. Organized and authored response to comments on draft EIR.*

*On-Call Biological Services Contract for Utility and Infrastructure Projects; San Diego Gas and Electric; San Diego, California. Ongoing on-call biological evaluation services were provided to SDG&E for transmission poles and accompanying infrastructure identified for maintenance or replacement activities. *Role: Assistant Project Manager focused on task project budgeting and invoicing support. Report writing assistance and field support provided to biologists as needed.*

*On-Call Environmental Consulting Services Contract for Downtown San Diego Redevelopment Projects; former City Centre Development Corporation (CCDC); San Diego, California. On-call environmental consulting services were provided to CCDC for various redevelopment projects occurring within the Downtown San Diego area, inducing high-density residential, retail/commercial, historical restoration, and public facility projects. *Role: Assistant Project Manager and Primary Author of focused environmental evaluations used to comply with CEQA review and project approval. Provided project budget maintenance, project scheduling, client relations, internal staff coordination, and document delivery.*

*San Elijo Lagoon Restoration Project EIR/Environmental Impact Statement; San Elijo Lagoon Conservancy; Encinitas, California. The San Elijo Lagoon Restoration Project involved the enhancement and restoration of the biological functions and values of the San Elijo Lagoon Ecological Reserve, located in city of Encinitas in San Diego County. The San Elijo Lagoon Conservancy administered a joint EIR/environmental impact statement for the U.S. Army Corps of Engineers and County of San Diego Department of Parks and Recreation. *Role: Assistant Project Manager and Section Author. Authored several EIR/environmental impact statement sections. Provided project budget maintenance, project scheduling, client and stakeholder relations, internal staff coordination, and document delivery.*

*Regional Beach Sand Project II Environmental Assessment/Final EIR; San Diego Association of Governments; San Diego, California. The San Diego Association of Governments and the U.S. Army Corps of Engineers placed 1.5 million cubic yards of beach quality sand on regional beaches to help address the erosional nature of the San Diego coastline. A joint Environmental Assessment/Final EIR was prepared to address the potential environmental consequences associated with dredging and placement of sand on numerous potential receiver sites in the San Diego region. *Role: Section Author and Permitting Support. Authored several EIR/EA sections. Prepared applications and supplemental information necessary to obtain permits from various jurisdictions and resource agencies.*

*Wood to Steel Pole Replacements Focused Environmental Impact Assessments; San Diego Gas and Electric; San Diego, California. SDG&E conducted major wood-to-steel projects to replace thousands of power poles with fire resistant steel poles throughout its service area in areas identified as susceptible to fire damage in the event of a wildland fire. Focused environmental assessments were prepared following a modified version of CEQA Appendix G guidelines to assess impacts related to implementing these utility improvements. *Role: Planning Specialist. Primary Author of environmental impact assessments for three separate transmission lines (tie lines) in eastern San Diego County.*

CHRIS MILLINGTON, M.A., RPA, SENIOR ARCHAEOLOGIST

Mr. Millington is a principal investigator in SWCA's Pasadena, California, office with 18 years of experience in cultural resources management. His responsibilities include technical oversight, research, project management, agency coordination, authoring cultural resources reports, analyzing spatial data, map production, and graphics. Across his entire career, Mr. Millington has contributed to over 300 compliance-driven projects with SWCA in eight states across the western United States. In the last 13 years, he has focused on projects and research predominantly within his native Southern California, including both rural and urban settings. Mr. Millington has developed expertise in CEQA compliance, urban archaeology, and Los Angeles history. He has overseen more than a dozen task orders for the City of Los Angeles Bureau of Engineering, served as a project manager and lead archaeologist for over 100 tasks orders supporting various Southern California Edison maintenance and construction projects across southern California, and since 2017, prepared CEQA technical studies over for over 60 individual projects within the City of Los Angeles. He regularly collaborates with engineers, construction crews, planners, and attorneys, on both the private and public sides, and is experienced in responding to mid-stream project design changes, public scrutiny, and unanticipated budget and schedule adjustments. Mr. Millington has extensive experience supporting public agencies for tribal consultation under Assembly Bill 52 (AB 52) and regularly conducts desktop sensitivity assessments for archaeological and tribal cultural resources.

YEARS OF EXPERIENCE

18

EXPERTISE

Los Angeles history

CEQA

Tribal consultation, AB 52 compliance

National Historic Preservation Act

National Environmental Policy Act

EDUCATION

M.A., Archaeology; University of New Mexico; 2006

B.A., Anthropology, e: Archaeology, m: Religious Studies; University of New Mexico; 2004

A.A., Liberal Arts; Long Beach City College; 2002

REGISTRATIONS / CERTIFICATIONS

Registered Professional Archaeologist No. 32790536

PERMITS

U.S. Bureau of Land Management Cultural Resource Use Permit (CA-20-28), Principal Investigator; California

SELECTED PROJECT EXPERIENCE

La Brea Tar Pits Master Plan EIR; Los Angeles County Natural History Museum; Los Angeles County, California. SWCA is preparing an EIR addressing the environmental impacts of significant improvements to this iconic site in central Los Angeles. Significant development has occurred in the project vicinity in recent years (e.g., at the adjacent LA County Museum of Art and with the LA Metro), and the EIR and approach to construction phasing will be highly scrutinized. In addition to leading the EIR process, SWCA is assisting with the public engagement process. The conceptual master plan was recently developed by the Natural History Museum for the future development and enhancement of the La Brea Tar Pits site. The master plan includes the existing museum and Hancock Park and seeks to unify the critical research sites, buildings, exhibition space, and the park with an inspiring new identity. *Role: Cultural Resources Specialist.*

Natural History Museum of Los Angeles County, Center for History and Culture Project; Los Angeles County Museum of Natural History; Los Angeles County, California. To facilitate the demolition of the existing Jean Delacour Auditorium and construction of an addition to the Los Angeles County Natural History Museum, SWCA analyzed environmental review options under CEQA and recommended a Class 32 Infill Exemption as the most cost- and time-efficient document. SWCA is currently completing the Class 32 Infill Exemption, and previously prepared the archaeological, paleontological, transportation, and historic preservation supporting technical studies. *Role: Senior Archaeologist. Oversaw assessment of archaeological resources, conducted historical research, produced maps/graphics and performed GIS analysis, and authored technical report.*

LA Plaza de Cultura y Artes; Los Angeles, Los Angeles County, California. Across seven contracts, three directly with the County of Los Angeles, SWCA provided expert cultural resources consultation for the LA Plaza de Cultura y Artes campus, in compliance with state and federal laws including Section 106 of the NHPA, the Native American Graves Protection and Repatriation Act (NAGPRA), NEPA, and CEQA. Services provided to date included archaeological

laboratory analysis, treatment and reburial of human remains, historical research, Native American and other interested party consultation, expert witness services, archaeological testing and data recovery, archaeological and Native American monitoring, technical reports, a Historic Properties Management Plan, an update to the Los Angeles Plaza Historic District National Register of Historic Places District nomination, and an Addendum EIR. SWCA provided technical expertise and consultation, ensuring compliance and allowing numerous phases of the project to come to successful conclusions. Role: Project Archaeologist. Supervised fieldwork, spatial data management and analysis, research, and reporting QA/QC.

Archaeological and/or Tribal Cultural Resource Technical Studies for CEQA Compliance; Multiple Clients; City of Los Angeles, California. SWCA has prepared technical reports assessing archaeological and/or tribal cultural resources on multiple land development projects within the City of Los Angeles. The projects include mixed-use developments in the Mid-City area, multi-family residential developments in suburban neighborhoods, construction of high-rise towers in Downtown Los Angeles, and single-family home remodeling projects. The technical studies were conducted by SWCA to inform various types of regulatory compliance documents, primarily pursuant to the California Environmental Quality Act (CEQA), but also supporting due diligence efforts where a project was found to meet CEQA exemption criteria. Each of the technical studies included archival research, ethnographic literature review, searches of the California Historical Resources Information System and Sacred Lands File search, and geoarchaeological assessments. *Role: Principal Investigator, Author/Co-Author, and Project Manager.*

Sample Project List within the City of Los Angeles:

- 1001 Olympic Boulevard
- 1024 Mateo
- 10850 Riverside Drive
- 1330 West Pico Boulevard
- 17346 Sunset Project
- 1855-1871 South Westwood Boulevard
- 2110 Bay Street
- 222 West 2nd Street
- 216-234 Pico Boulevard
- 2800 Casitas Loft
- 2859 Coldwater Canyon Drive
- 2900 Wilshire Boulevard
- 3rd and Fairfax
- 350 S Figueroa
- 3600 Wilshire Boulevard
- 4850 Hollywood Boulevard
- 4882-4888 Lankershim Boulevard
- 520 Mateo Street
- 5407 Wilshire Boulevard
- 5th and Hill
- 6733 Sepulveda Residential
- 6834-6838 North Baird Avenue
- Arts District Center
- Culver City Transfer Station
- Korean American National Museum
- Marquette Residential Development
- Olympic Tower
- Southern California Flower Market
- Venice Place
- Victory Boulevard

Secondary Sewer Renewal Program (SSRP) N11 7th Street and Valencia Street Cultural Resources Assessment (W.O. SZC13161); Los Angeles Department of Public Works (LADPW), Bureau of Engineering (BOE); Los Angeles County, California. LADPW BOE awarded SWCA with a task order to prepare an archaeological and paleontological assessment in support of an SSRP in a commercial and residential portion of the downtown Los Angeles area. The task included background research and records searches to identify any existing archaeological or paleontological resources and assess the potential for undocumented resources that could be encountered during construction. The study was conducted as part of the project's environmental review, which was completed consistent with CEQA and standard BOE environmental review practices. SWCA developed detailed mitigation measures that were incorporated into the project design. *Role: Project Manager and Cultural Resources Specialist.*

Alameda Corridor East (ACE) Monitoring and Management Services for the Trench Package; The San Gabriel Valley Council of Governments (SGVCOG); San Gabriel, Alhambra, Rosemead, Los Angeles County, California. SWCA conducted technical studies and prepared Environmental Impact Report (EIR) sections for compliance with state and federal statutes, particularly CEQA and NEPA, for review by Caltrans, the lead agency. Cultural resources work included archaeological and architectural history surveys and evaluation studies, in compliance with Section 106 of the NHPA and Caltrans standards. SWCA oversaw mitigation for adverse effects to the CRHR/NRHP-listed San Gabriel Mission. *Role: Project Archaeologist. Total station mapping, GPS data collection, geospatial data management and analysis, and map production for field-use and report graphics, archival research.*

DEBI HOWELL-ARDILA, MHP, SR. ARCHITECTURAL HISTORIAN

Ms. Howell-Ardila is an award-winning historic preservation professional with over 17 years of experience in environmental compliance and historic preservation. She leads SWCA's Southern California Architectural History Group. She has led site investigations and evaluations for thousands of properties throughout California, with a focus on Southern California and the San Francisco Bay Area. Her experience includes preparation of thematic historic context statements, citywide historic resource surveys, environmental compliance studies and documentation in support of CEQA, federal and local landmark nominations, Mills Act applications, and Secretary of the Interior's Standards project review. She exceeds the Secretary of the Interior's Professional Qualification Standards in Architectural History and History.

YEARS OF EXPERIENCE

17

EXPERTISE

Specialized practice in historic preservation planning and policy

Specialized expertise in program- and project-level CEQA analyses

Secretary of the Interior's Standards project review and compliance

EDUCATION

M.H.P., Historic Preservation; University of Southern California, School of Architecture; 2010

B.A., German and Architectural History; University of California, Berkley; 1997

REGISTRATIONS / CERTIFICATIONS

Meets and exceeds requirements in the Secretary of the Interior's Professional Qualification Standards in Architectural History and History

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

La Brea Tar Pits Master Plan EIR; Los Angeles County Natural History Museum; Los Angeles County, California. SWCA is preparing an EIR addressing the environmental impacts of significant improvements to this iconic site in central Los Angeles. Significant development has occurred in the project vicinity in recent years (e.g., at the adjacent LA County Museum of Art and with the LA Metro), and the EIR and approach to construction phasing will be highly scrutinized. In addition to leading the EIR process, SWCA is assisting with the public engagement process. The conceptual master plan was recently developed by the Natural History Museum for the future development and enhancement of the La Brea Tar Pits site. The master plan includes the existing museum and Hancock Park and seeks to unify the critical research sites, buildings, exhibition space, and the park with an inspiring new identity. *Role: Senior Architectural Historian and principal researcher/author.*

City of Colton, Cultural Resources Element and Historic Preservation Ordinance Updates, Colton, California. SWCA is currently updating the City of Colton's Cultural Resources Element and providing recommendations for potential updates to its Historic Preservation Ordinance. Work efforts include development of clear, user-friendly Goals, Policies, and Action Items; planning and leading community workshops and hearings with commissions and City Council; and guiding the element through the reviews and approval process. *Role: Senior Architectural Historian and principal researcher/author.*

City of San Gabriel Historic Preservation and Cultural Resources Ordinance Update; City of San Gabriel Department of Planning; California. SWCA updated the City of San Gabriel Historic Preservation and Cultural Resources Ordinance. In 2017/2018, San Gabriel's Historic Preservation and Cultural Resources Ordinance Update won preservation awards from the Los Angeles Conservancy and California Preservation Foundation. *Role: Project Manager and Lead Author/Historic Preservation Specialist.*

Los Angeles Unified School District (LAUSD) Design Guidelines and Treatment Approaches for Historic Schools; LAUSD; Los Angeles County, California. SWCA prepared district-wide design guidelines for LAUSD, the second largest public school district in the United States. Given LAUSD's 130-year history and expansive geographic range, the LAUSD Design Guidelines provided detailed treatment approaches for a range of school types, architectural styles, and projects, using the Secretary of the Interior's Standards as the point-of-departure. *Role: Project Manager and Lead Historic Preservation Specialist. Served as the project manager and principal author of the design guidelines.*

City of Manhattan Beach Historic Preservation Ordinance; City of Manhattan Beach Department of Community Development; Los Angeles County, California. SWCA drafted a new Historic Preservation Ordinance for the City of Manhattan Beach. Work efforts included training sessions and outreach to the City's Planning Commission and City Council, as well as public workshop hearings, stakeholder outreach, and developing educational materials. *Role: Project Manager and Lead Historic Preservation Specialist. Led efforts to provide historic*

AWARDS

2019: California Preservation Foundation Award, *City of Riverside Latino Historic Context Statement*

2018: California Preservation Foundation Award, City of San Gabriel Historic Preservation and Cultural Resources Ordinance

2018: Los Angeles Conservancy Preservation Award, City of San Gabriel Historic Preservation and Cultural Resources Ordinance

2015: Los Angeles Conservancy Preservation Award, *LAUSD Historic Context Statement, 1870 to 1969*

2014: California Preservation Foundation Award, *LAUSD Historic Context Statement, 1870 to 1969*

preservation consulting services in support of a new historic preservation ordinance and Mills Act Tax Abatement program in the City of Manhattan Beach.

1023 N. Soldano Avenue, Azusa, Historic Preservation Project Review; City of Azusa Planning Division, Azusa, California. Ms. Howell-Ardila recently completed historic preservation project review for the City of Azusa Planning Division for 1023 N. Soldano Avenue. Constructed in 1905, the property is a two-story, single-family residence included on City's list of Potential Historic Landmarks. Ms. Howell-Ardila provided a due-diligence Memorandum for the Record and *Secretary's Standards* project review as part of the entitlements process for modifications to the property. Ms. Howell-Ardila also completed a project impacts screening to offer guidance on the potential for direct or indirect significant adverse impacts to historical resources. *Role: Project Manager and Lead Author/Historic Preservation Specialist*

Historic Resources Technical Study, Existing Sites Technical Memorandum; Academy of Art University; San Francisco, California. SWCA prepared a multi-property historic resources technical study in support of an Existing Sites Technical Memorandum (ESTM) for the Academy of Art University. Key issues included updating historic resource evaluations for 26 properties, documenting exterior and interior character-defining features and alterations over time, and subjecting unpermitted alterations to Secretary of the Interior's Standards project review and analyzing potential impacts. Treatment approaches were also recommended to facilitate compliance with the Secretary of the Interior's Standards. SWCA's Architectural History team completed/updated historic resource evaluations for 26 properties on an accelerated schedule of five months. *Role: Lead Architectural Historian and Project Manager.*

LA Plaza Cultura Village Environmental Impact Report (EIR), Cultural Resources Technical Report; County of Los Angeles; Los Angeles County, California. Analysis of potential impacts to historic resources dealt primarily with indirect impacts to adjacent historic districts, an analysis based on study of the Secretary of the Interiors Standards for the Treatment of Historic Properties as well as community plan design guidelines. *Role: Senior Architectural Historian/principal author.*

*Riverside Latino Historic Context Statement; City of Riverside; Riverside County, California. Preparation of the *City of Riverside Latino Historic Context Statement*, which explored over a century of history and culture of Riverside's Latino community. This effort was recognized with an award from the California Preservation Foundation in 2019. *Role: Principal Author/Investigator. Authored historic context statement.*

Monterey Regional Airport Historic Resources Survey Report; Coffman Associates; Monterey County, California. In support of CEQA environmental review, SWCA conducted a historic resources survey and evaluation for the Monterey Regional Airport. Efforts included archival research, site investigations, and survey and preparation of a historic resources technical report summarizing the results. *Role: Senior Architectural Historian/principal author.*

Historic District Survey for the Air Force Research Laboratory; Edwards Air Force Base, California. SWCA completed a comprehensive, context-driven historic resources survey and historic district update of the Edwards Air Force Base Air Force Research Laboratory. Using the multiple-property documentation historic context statement prepared by SWCA, architectural historians completed an intensive-level survey and evaluation of over 230 properties. Subsequent to these efforts, SWCA prepared a technical report, which documented the results and provided management recommendations. *Role: Architectural Historian.*

APPENDIX N

Tree Survey for the La Brea Tar Pits Site

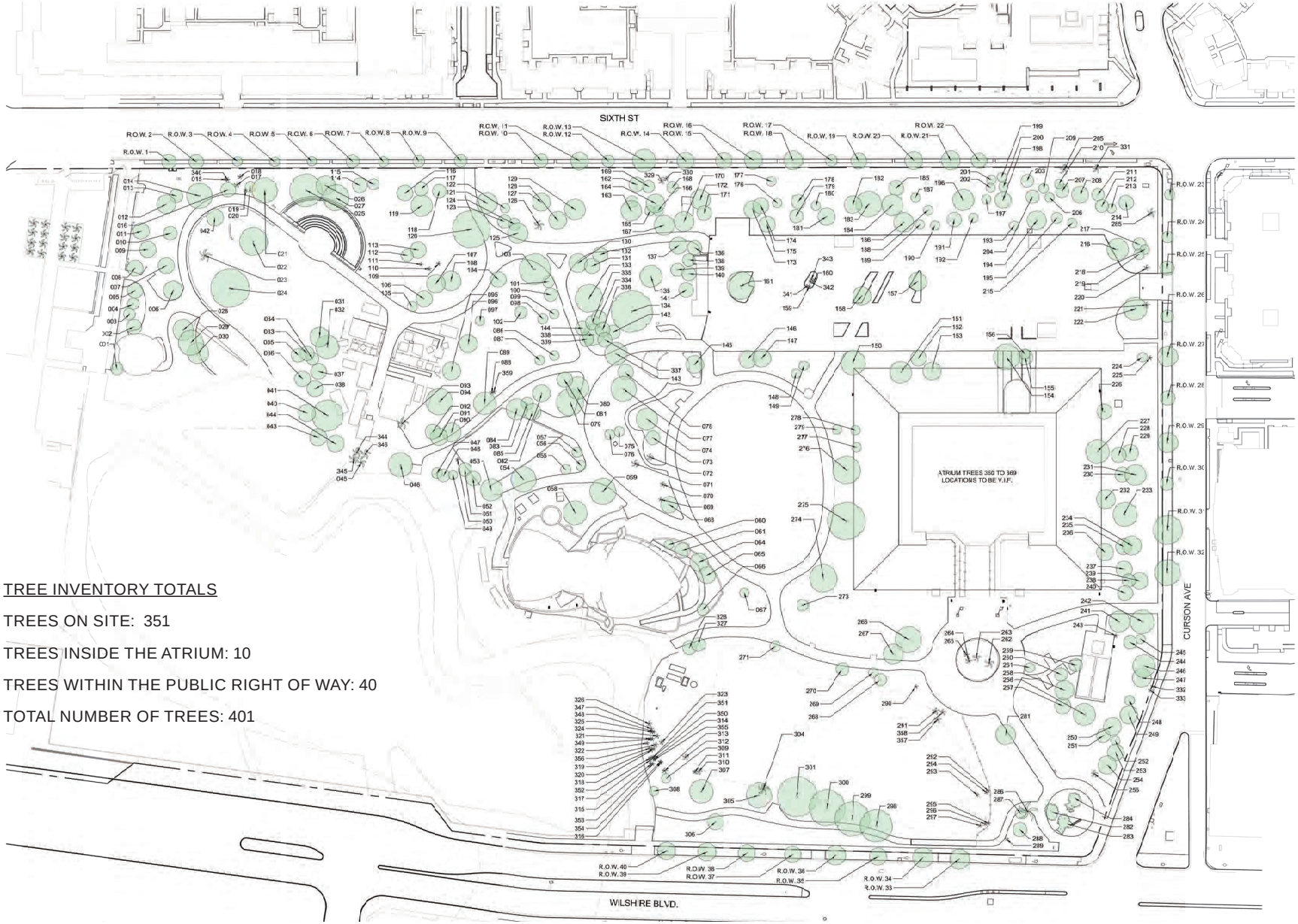
NATURAL HISTORY MUSEUMS OF LA COUNTY
LA BREA TAR PITS

TREE INVENTORY

DECEMBER 05, 2024

GRUENASSOCIATES
ARCHITECTURE PLANNING INTERIORS LANDSCAPE

LA BREA TAR PITS - TREE INVENTORY



TREE INVENTORY TOTALS

TREES ON SITE: 351

TREES INSIDE THE ATRIUM: 10

TREES WITHIN THE PUBLIC RIGHT OF WAY: 40

TOTAL NUMBER OF TREES: 401

N

N.T.S.

LA BREA TAR PITS - TREE INVENTORY

TREE INVENTORY // IDENTIFICATION

No.	Species
001	Eucalyptus nicholii
002	Eucalyptus citriodora
003	Eucalyptus citriodora
004	Eucalyptus nicholii
005	Eucalyptus nicholii
006	Quercus agrifolia
007	Platanus acerifolia
008	Platanus acerifolia
009	Platanus acerifolia
010	Platanus acerifolia
011	Platanus acerifolia
012	Platanus acerifolia
013	Geijera parvifolia
014	Jacaranda mimosifolia
015	Washingtonia robusta
016	Pistacia chinensis
017	Washingtonia robusta
018	Washingtonia robusta
019	Washingtonia robusta
020	Pistacia chinensis
021	Quercus agrifolia
022	Quercus agrifolia
023	Washingtonia robusta
024	Platanus racemosa
025	Tipuana tipu
026	Tipuana tipu
027	Tipuana tipu
028	Eucalyptus cladocalyx
029	Pinus eldarica
030	Pinus eldarica
031	Pinus eldarica
032	Pinus halepensis
033	Platanus racemosa
034	Platanus racemosa
035	Eucalyptus sideroxylon
036	Eucalyptus sideroxylon
037	Pinus halepensis
038	Pinus halepensis
039	*Omit*
040	Eucalyptus sideroxylon
041	Pinus halepensis
042	Pinus sabiniana
043	Geijera parvifolia
044	Eucalyptus camaldulensis

No.	Species
045	Washingtonia robusta
046	Jacaranda mimosifolia
047	Sequoia sempervirens
048	Cupaniopsis anacardioides
049	Eucalyptus camaldulensis
050	Washingtonia robusta
051	Cinnamomum camphora
052	Geijera parvifolia
053	Platanus racemosa
054	Platanus racemosa
055	Ginkgo biloba
056	Ginkgo biloba
057	Ginkgo biloba
058	Platanus racemosa
059	Platanus racemosa
060	Pinus thunbergii
061	Cedrus deodara
062	*Omit*
063	*Omit*
064	Pinus canariensis
065	Pinus canariensis
066	Pinus canariensis
067	Lagerstroemia indica
068	Platanus acerifolia
069	Washingtonia robusta
070	Washingtonia robusta
071	Washingtonia robusta
072	Washingtonia robusta
073	Quercus agrifolia
074	Rhus ovata
075	Rhus ovata
076	Rhus ovata
077	Heteromeles arbutifolia
078	Platanus racemosa
079	Schinus terebinthifolius
080	Schinus terebinthifolius
081	Schinus terebinthifolius
082	Schinus terebinthifolius
083	Platanus racemosa
084	Platanus racemosa
085	Platanus racemosa
086	Quercus agrifolia
087	Quercus agrifolia
088	Washingtonia robusta
089	Platanus racemosa
090	Populus fremontii
091	Populus fremontii

No.	Species
092	Populus fremontii
093	Washingtonia robusta
094	Fraxinus uhdei
095	Platanus racemosa
096	Jacaranda mimosifolia
097	Lagerstroemia indica
098	Ginkgo biloba
099	Ginkgo biloba
100	Ginkgo biloba
101	Ginkgo biloba
102	Quercus lobata
103	Platanus acerifolia
104	Pinus halepensis
105	Eucalyptus ficifolia
106	Platanus racemosa
107	Pinus torreyana
108	Olea europea
109	Washingtonia robusta
110	Washingtonia robusta
111	Washingtonia robusta
112	Agonis flexuosa
113	Schinus terebinthifolius
114	Eucalyptus nicholii
115	Pistacia chinensis
116	Platycladus arborvitae
117	Platycladus arborvitae
118	Platycladus arborvitae
119	Jacaranda mimosifolia
120	Eucalyptus globulus
121	Jacaranda mimosifolia
122	Calocedrus decurrens
123	Pinus halepensis
124	Pinus halepensis
125	Pinus halepensis
126	Washingtonia robusta
127	Jacaranda mimosifolia
128	Pinus canariensis
129	Pinus canariensis
130	Quercus agrifolia
131	Quercus agrifolia
132	Quercus agrifolia
133	Aesculus californica
134	Platanus racemosa
135	Sequoia sempervirens
136	Pinus sp.
137	Sequoia sempervirens
138	Umbellularia californica

No.	Species
139	Umbellularia californica
140	Sequoia sempervirens
141	Sequoia sempervirens
142	Celtis sp.
143	Sambucus mexicana
144	Juglans californica
145	Cupressus macrocarpa
146	Pinus sabiniana
147	Pinus sabiniana
148	Quercus agrifolia
149	Quercus agrifolia
150	Schinus terebinthifolius
151	Koelreuteria bipinnata
152	Koelreuteria bipinnata
153	Koelreuteria bipinnata
154	Platanus racemosa
155	Platanus racemosa
156	Cinnamomum camphora
157	Pinus torreyana
158	Pinus radiata
159	Washingtonia robusta
160	Washingtonia robusta
161	Pinus torreyana
162	Schinus terebinthifolius
163	Jacaranda mimosifolia
164	Jacaranda mimosifolia
165	Prunus Persica
166	Lagerstroemia indica
167	Calocedrus decurrens
168	Platanus acerifolia
169	Sapote sp.
170	Cedrus atlantica
171	Jacaranda mimosifolia
172	Cupaniopsis anacardioides
173	Cupressus sempervirens
174	Cupressus sempervirens
175	Cupressus sempervirens
176	Jacaranda mimosifolia
177	Prunus persica
178	Jacaranda mimosifolia
179	Jacaranda mimosifolia
180	Jacaranda mimosifolia
181	Cupressus sempervirens
182	Jacaranda mimosifolia
183	Ceratonia siliqua
184	Jacaranda mimosifolia
185	Robinia pseudoacacia

No.	Species
186	Cedrus deodara
187	Pinus sabiniana
188	Koelreuteria bipinnata
189	Koelreuteria bipinnata
190	Koelreuteria bipinnata
191	Koelreuteria bipinnata
192	Koelreuteria bipinnata
193	Magnolia grandiflora
194	Magnolia grandiflora
195	Koelreuteria bipinnata
196	Jacaranda mimosifolia
197	Ligustrum lucidum
198	Ligustrum lucidum
199	Platycladus arborvitae
200	Platycladus arborvitae
201	Platycladus arborvitae
202	Platycladus arborvitae
203	Platycladus arborvitae
204	Jacaranda mimosifolia
205	Washingtonia robusta
206	Jacaranda mimosifolia
207	Ligustrum lucidum
208	Jacaranda mimosifolia
209	Ligustrum lucidum
210	Platycladus arborvitae
211	Jacaranda mimosifolia
212	Jacaranda mimosifolia
213	Jacaranda mimosifolia
214	Jacaranda mimosifolia
215	Koelreuteria bipinnata
216	Jacaranda mimosifolia
217	Pinus eldarica
218	Pinus eldarica
219	Pinus eldarica
220	Washingtonia robusta
221	Washingtonia robusta
222	Schinus molle
223	*Omit*
224	Cinnamomum camphora
225	Washingtonia robusta
226	Platanus acerifolia/racemosa hybrid
227	Platanus racemosa
228	Ceratonia siliqua
229	Ceratonia siliqua
230	Ligustrum lucidum
231	Ligustrum lucidum
232	Robinia pseudoacacia

LA BREA TAR PITS - TREE INVENTORY

TREE INVENTORY // IDENTIFICATION (CONT.)

No.	Species
233	Jacaranda mimosifolia
234	Ligustrum lucidum
235	Jacaranda mimosifolia
236	Jacaranda mimosifolia
237	Ligustrum lucidum
238	Sambucus mexicana
239	Pinus canariensis
240	Pinus halepensis
241	Jacaranda mimosifolia
242	Schinus molle
243	Washingtonia robusta
244	Koelreuteria bipinnata
245	Koelreuteria bipinnata
246	Cedrus deodara
247	Cedrus deodara
248	Lagerstroemia indica
249	Geijera parvifolia
250	Tabebuia avellanedae
251	Tabebuia avellanedae
252	Tipuana tipu
253	Tipuana tipu
254	Tipuana tipu
255	Washingtonia filifera
256	Tipuana tipu
257	Tipuana tipu
258	Tipuana tipu
259	Tipuana tipu
260	Tipuana tipu
261	Pinus halepensis
262	Syagrus romanzoffiana
263	Syagrus romanzoffiana
264	Syagrus romanzoffiana
265	Syagrus romanzoffiana
266	Erythrina caffra
267	Pinus halepensis
268	Platanus racemosa
269	Sambucus mexicana
270	Heteromeles arbutifolia
271	Prunus ilicifolia
272	*Omit*
273	Tabebuia avellanedae
274	Tipuana tipu
275	Tipuana tipu
276	Tipuana tipu
277	Ginkgo biloba
278	Ginkgo biloba
279	Ginkgo biloba

No.	Species
280	*Omit*
281	Fraxinus uhdei
282	Melaleuca armillaris
283	Melaleuca armillaris
284	Melaleuca armillaris
285	Washingtonia robusta
286	Phoenix canariensis
287	Cupaniopsis anacardioides
288	Ulmus parvifolia
289	Washingtonia robusta
290	Washingtonia robusta
291	Washingtonia robusta
292	Washingtonia robusta
293	Washingtonia robusta
294	Washingtonia robusta
295	Washingtonia robusta
296	Washingtonia robusta
297	Washingtonia robusta
298	Eucalyptus globulus
299	Eucalyptus globulus
300	Eucalyptus globulus
301	Eucalyptus globulus
302	*Omit*
303	*Omit*
304	Washingtonia robusta
305	Sambucus mexicana
306	Eucalyptus viminalis
307	Ceratonia siliqua
308	Eucalyptus viminalis
309	Chamaerops humilis
310	Washingtonia robusta
311	Washingtonia robusta
312	Washingtonia robusta
313	Washingtonia robusta
314	Washingtonia robusta
315	Washingtonia robusta
316	Washingtonia robusta
317	Washingtonia robusta
318	Washingtonia robusta
319	Washingtonia robusta
320	Washingtonia robusta
321	Washingtonia robusta
322	Washingtonia robusta
323	Washingtonia robusta
324	Washingtonia robusta
325	Washingtonia robusta
326	Washingtonia robusta

No.	Species
327	Sambucus mexicana
328	Quercus agrifolia
329	Washingtonia robusta
330	Washingtonia robusta
331	Washingtonia robusta
332	Washingtonia robusta
333	Washingtonia robusta
334	Salix lasiolepis
335	Salix lasiolepis
336	Salix lasiolepis
337	Juglans californica
338	Salix lasiolepis
339	Salix lasiolepis
340	Washingtonia robusta
341	Washingtonia robusta
342	Washingtonia robusta
343	Washingtonia robusta
344	Washingtonia robusta
345	Washingtonia robusta
346	Washingtonia robusta
347	Washingtonia robusta
348	Washingtonia robusta
349	Washingtonia robusta
350	Washingtonia robusta
351	Washingtonia robusta
352	Washingtonia robusta
353	Washingtonia robusta
354	Washingtonia robusta
355	Washingtonia robusta
356	Washingtonia robusta
357	Washingtonia robusta
358	Washingtonia robusta
359	Washingtonia robusta
360	Schefflera pueckleri
361	Schefflera pueckleri
362	Schefflera pueckleri
363	Schefflera pueckleri
364	Stenocarpus sinuatus
365	Schefflera pueckleri
366	Ficus rubiginosa
367	Lagerstroemia indica
368	Ginkgo biloba
369	Ficus rubiginosa

PUBLIC R.O.W TREE INVENTORY // IDENTIFICATION

ROW tree No.	Species
001	Jacaranda mimosifolia
002	Jacaranda mimosifolia
003	Jacaranda mimosifolia
004	Jacaranda mimosifolia
005	Jacaranda mimosifolia
006	Jacaranda mimosifolia
007	Jacaranda mimosifolia
008	Jacaranda mimosifolia
009	Jacaranda mimosifolia
010	Jacaranda mimosifolia
011	Jacaranda mimosifolia
012	Jacaranda mimosifolia
013	Jacaranda mimosifolia
014	Jacaranda mimosifolia
015	Jacaranda mimosifolia
016	Jacaranda mimosifolia
017	Jacaranda mimosifolia
018	Jacaranda mimosifolia
019	Jacaranda mimosifolia
020	Jacaranda mimosifolia
021	Jacaranda mimosifolia
022	Jacaranda mimosifolia
023	Jacaranda mimosifolia
024	Jacaranda mimosifolia
025	Jacaranda mimosifolia
026	Jacaranda mimosifolia
027	Jacaranda mimosifolia
028	Jacaranda mimosifolia
029	Jacaranda mimosifolia
030	Jacaranda mimosifolia
031	Jacaranda mimosifolia
032	Jacaranda mimosifolia
033	Platanus racemosa
034	Platanus racemosa
035	Platanus racemosa
036	Platanus racemosa
037	Platanus racemosa
038	Platanus racemosa
039	Platanus racemosa
040	Platanus racemosa