VOLUME I

ENVIRONMENTAL ASSESSMENT

RESTORATION OF HISTORIC STREETCAR SERVICE IN DOWNTOWN LOS ANGELES

ENGINEERING
CITY OF LOS ANGELES

LADOT
Moving Los Angeles Forward

Los Angeles STREETCAR!

Metro

U.S. Department of Transportation
Federal Transit Administration

JULY 2018
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Acronyms

°F Fahrenheit
µg/m³ micrograms per cubic meter
AADT annual average daily traffic
AC Alternating Current
ADA Americans with Disabilities Act
APE area of potential effect
AQMP Air Quality Management Plan
B.P. Before Present
BACT Best Available Control Technology
Basin South Coast Air Basin
BIDs business improvement districts
BOE Bureau of Engineering
BSMP Broadway Streetscape Master Plan
BTU British thermal unit
CAA Clean Air Act
CDFW California Department of Fish and Wildlife
CEQ Council on Environmental Quality
CEQA California Environmental Quality Act
CFR Code of Federal Regulations
City City of Los Angeles
CO carbon monoxide
CPUC California Public Utilities Commission
CRA/LA Community Redevelopment Agency of the City of Los Angeles
CRHR California Register of Historical Resources
DASH Downtown Area Short Hop
dB decibel
dBA A-Weighted Sound Level
DC direct current
Diesel PM diesel particulate matter
DPW Department of Public Works
EA Environmental Assessment
EIR Environmental Impact Report
EO Executive Order
EPA U.S. Environmental Protection Agency
FHWA Federal Highway Administration
FONSI finding of no significant impact
FR Federal Register
FRA Federal Railroad Administration
FTA Federal Transit Administration
Gal/yr  Gallons per Year
GHG  Greenhouse Gas
GTK  General Thad Kosciuszko
HAP  hazardous air pollutant
HCMs  Historic-Cultural Monuments
HDLADG  Historic Downtown Los Angeles Design Guidelines
HP  horsepower
Interstate 110  Harbor Freeway
KOPs  Key Observation Points
LABOE  City of Los Angeles Department of Public Works, Bureau of Engineering
LACE  Los Angeles Consolidated Electric Railway
LADOT  City of Los Angeles Department of Transportation
LADWP  Los Angeles Department of Water and Power
LAFD  Los Angeles Fire Department
LAMC  Los Angeles Municipal Code
LAPD  Los Angeles Police Department
LARy  Los Angeles Railway Corporation
LASD  Los Angeles County Sheriff’s Department’s
LASED  Los Angeles Sports and Entertainment District
LASI  Los Angeles Streetcar Inc.
Ldn  Day/Night Noise Level
LED  Light Emitting Diode
LEED  Leadership in Energy & Environmental Design
LEP  limited English proficiency
Leq  equivalent noise level
LOS  level of service
LPA  Locally Preferred Alternative
LRT  Light rail transit
MAP-21  Moving Ahead for Progress in the 21st Century Act
Metro  Los Angeles County Metropolitan Transportation Authority
MFR  Multi-family Residential
MMBTU/yr  million British thermal units per year
MOCA  Museum of Contemporary Art
mph  miles per hour
MPO  metropolitan planning organization
MSAT  mobile source air toxics
MSF  maintenance and storage facility
NAAQS  National Ambient Air Quality Standards
NEPA  National Environmental Policy Act
NHPCA  National Historic Preservation Act
NO2  Nitrogen Dioxide
Executive Summary

ES.1 Introduction

This Environmental Assessment (EA) is to inform decision-makers and the general public of potential adverse effects to the human and natural environment that could result from construction and operation of the Restoration of Historic Streetcar Service in Downtown Los Angeles (Project). The Federal Transit Administration (FTA) is the federal lead agency for the Project under the National Environmental Policy Act (NEPA). The City of Los Angeles (City) is the local lead agency for the Project. Development of the Project and its environmental review process are being managed through the joint cooperation of the City Department of Transportation (LADOT), Bureau of Engineering (LABOE), and the Los Angeles County Metropolitan Transportation Authority (Metro). Additional support is being provided by City Council District 14 and Los Angeles Streetcar Inc. (LASI), an independent non-profit agency.

ES.2 Purpose and Need

The primary purpose of the Project is to enhance mobility through expanded transit circulation service and support the growth and revitalization of downtown Los Angeles. By connecting residential and employment areas, shopping districts, civic resources, cultural institutions, historic districts and landmarks, and entertainment venues, and by providing connectivity to other transit services, the Project would improve mobility and accessibility with a new transportation mode for people who live and work in the downtown area, as well as for visitors. The Project is intended to fulfill the following objectives:

- Support the growth and revitalization of downtown Los Angeles, including its historic districts;
- Enhance mobility and transit circulation in downtown Los Angeles;
- Create pedestrian-oriented amenities interconnected with sidewalks and public space that will enhance downtown Los Angeles’ distinct identity; and
- Protect and improve aspects of the downtown core, including reducing automobile trips within downtown Los Angeles thereby reducing greenhouse gas (GHG) emissions.

In evaluating the activity centers, districts, characteristics, demographics, and travel conditions within the study area, the following themes have emerged that reinforce the need for the Project:

- A topographically and geographically disconnected pedestrian network exists in the downtown area;
- There is a lack of an available centralized downtown transit route to complement the Downtown Area Short Hop (DASH) service;
- Increased demand for transit service is emerging from development and population, household, and employment growth in downtown that existing facilities cannot serve;
- Traffic patterns and parking demands both currently constrain intra-downtown mobility by automobile; and
- Underutilized land and historic buildings could be brought to higher and better uses if additional means of access were available.
ES.3 Background

Restoration of downtown streetcar service is an idea that has been considered for over a decade by Metro, as well as the former Community Redevelopment Agency of the City of Los Angeles (CRA/LA), and the former Central City Association Red Car Advisory Committee. Advocacy groups such as LASI and members of Council District 14’s “Bringing Back Broadway” initiative have also been important drivers of the effort. Beginning as a concept aimed at tourism, research and outreach conducted over the past 15 years has resulted in a project geared toward promoting community revitalization, reactivating historic resources, and supporting general economic development in downtown Los Angeles, in addition to creating a new, easily accessible transit opportunity for the downtown area. In 2006, CRA/LA finalized the Feasibility Study for the Resurrection of the Red Car Trolley Services in the Los Angeles Downtown Area (CRA/LA 2006), which analyzed various alignment concepts, determined the feasibility of restoring the streetcar system, and identified engineering considerations, ridership estimates and needs, potential costs of implementing the streetcar, and potential funding sources. As contracted by CRA/LA, Metro moved the development process forward and assisted CRA/LA with the Restoration of Historic Streetcar Service in Downtown Los Angeles Alternatives Analysis, which was completed in January 2012 (Metro 2012). That document analyzed a multitude of potential alignments in its initial screening process, leading to the development of seven feasible alternatives. Those alternatives were then evaluated across a variety of factors, including capital and operating cost, design constraints, service area, connections to transit and other modes of transportation, environmental impacts, and economic development opportunities. A final screening analysis identified 7th Street, which was designated at that time by the CRA/LA Board of Commissioners and the Los Angeles City Council as the Locally Preferred Alternative (LPA), for further environmental analysis. The 7th Street Alignment Alternative (see description below) was selected because of favorable ridership estimates, a high combined average of daily boardings, and total boardings per mile; low capital, operating, and maintenance costs; and local community support. In addition to the LPA, a second concept that would use 9th Street instead of 7th Street between Figueroa Street and Hill Street was identified as part of this process to account for vehicle lane reductions along 7th Street implemented by LADOT as part of the 2010 Bicycle Master Plan (DCP 2011). The 9th Street Alternative was therefore, included to provide an alternative to address potential traffic impacts that could occur on 7th Street.

In accordance with the California Environmental Quality Act (CEQA), the City assessed multiple alternatives in an Environmental Impact Report (EIR). The EIR considered 7th and 9th Streets streetcar alignments, four maintenance and storage facility (MSF) sites, and various station platform and traction power substation (TPSS) locations. The CEQA process was completed on November 29, 2016 when the City Council certified the Final EIR and adopted the Findings of Fact and the Statement of Overriding Considerations along with the Mitigation Monitoring and Reporting Program. The City, in cooperation with LASI and Metro, adopted the Project or LPA, as:

- 7th Street Alternative without a Grand Avenue Extension
- Grand Avenue Extension as an optional addition to the Project, if additional funding can be identified
- MSF to be located at Broadway and 2nd Street or 11th Street/Olive Street (East)
- Station platform locations to be determined as final design of the Project proceeds
- TPSS locations to be determined as final design of the Project proceeds
ES.4 7th Street Alignment Alternative

The 7th Street Alignment Alternative (Project) would construct and implement streetcar service along an alignment that would begin at the corner of Hill and 1st Streets. From 1st Street, the streetcar would turn south on Broadway, traveling to 11th Street where it would turn west and continue on to Figueroa Street. The streetcar would then turn north on Figueroa Street and travel to 7th Street, where it would turn east. From 7th Street, the streetcar would turn north on Hill Street, then continue back to 1st Street, completing the circuit. Potential inclusion of a Grand Avenue Extension would also provide a two-way alignment spur west along 1st Street, beginning at Hill Street, and continuing south along Grand Avenue to a stop north of 2nd Street. The loop would be up to 3.8 miles in length. The regional location is shown in Figure ES-1 and the alignment is shown in Figure ES-2.

ES.4.1 Vehicles

The Project’s operating plan calls for 7 minute headways (i.e., time intervals between vehicles) during peak periods. The streetcars would be articulated to make tight turns and have a capacity of approximately 100 passengers. The streetcars would be similar to the modern streetcar models that are currently used in other cities in the United States. The streetcars would be designed with low floors to be compliant with the Americans with Disabilities Act (ADA). Operating speeds would be at the maximum posted downtown speed limit, which is currently 25 miles per hour (mph) on all streets other than Figueroa Street, between 5th Street and Pico Boulevard, where it is 30 mph.

ES.4.2 Platforms

The current plans include up to 24 platforms. The streetcars would make stops at 23 stations along the alignment, and the potential Grand Avenue Extension includes one additional station. Platforms would be located adjacent to the sidewalk under the Project, although the Grand Avenue Extension would include a platform in the center of Grand Avenue. Locations are shown in Figure ES-2 and described in detail in Chapter 3.0, Alternatives and LPA Selection Process, within the description of Project.
Figure ES-1. Regional Location Map
Figure ES-2. Proposed Downtown Los Angeles Streetcar Route
Platforms would transition from the sidewalk to match or nearly match the floor height of the streetcar vehicles. Platforms would be designed and constructed to connect to the sidewalk in a way that meets ADA and building access requirements. Platform locations would be chosen to avoid conflicts with existing driveways; therefore, they could be located mid-block or on the far side of intersections, as required.

**ES.4.3 Support Facilities**

Electrical power would be supplied to streetcar vehicles through an overhead contact system (OCS). There are two potential configurations for the OCS catenary wires, which would supply electrical power to the streetcar vehicles. One configuration would be to support the contact wire with a span wire between two poles located on either side of the street, perpendicular to the streetcar track. Another configuration would support the contact wire from cantilever arms connected to single poles. Configurations would be site-specific and be made based upon engineering design and aesthetic considerations. Both of these configurations could use decorative poles chosen to be consistent with the streetscape along the Project alignment. The streetcars would be powered by an estimated five TPSS units spaced relatively evenly throughout the alignment to provide Direct Current (DC) power for the streetcars. Proposed locations of the five TPSS units and alternative locations are shown in Figure ES-2 and addresses are identified in Chapter 3.0, Alternatives and LPA Selection Process.

The Project would require an MSF to provide a location for secure storage of streetcar vehicles when they are not in operation, and regular light maintenance of the vehicles to keep them clean and in good operating condition. Two sites are being assessed for the MSF: (1) the southeast corner of 11th and Olive Streets; or (2) the west side of Broadway between 2nd and 3rd Streets. The MSF would consist of an enclosed building and an outdoor area where routine inspections, maintenance work, and light repairs could be performed. The MSF would comply with the City’s *Green Building Code* and also meet minimum Leadership in Energy & Environmental Design (LEED) certification requirements.
ES.5 Safety

Streetcar movement would be governed by "line-of-sight" operations, with passage through intersections controlled by traffic signals. Line-of-sight operations mean that streetcars would be controlled by an operator who would proceed when traffic signals and traffic allow, and would stop for traffic signals, station stops, pedestrians, bicycles, and other vehicles. A separate signal head may be provided at intersections for streetcar control. Transit signals (i.e., special signals separated from the general-purpose signal system) would be necessary when the streetcar requires a special traffic signal phase to maneuver so as to avoid conflicting with general traffic. Where necessary, train to wayside communication (TWC) would be used to limit conflicting traffic at turning locations and provide streetcars a dedicated signal phase to move safely across an intersection.

The Project would be designed to maximize pedestrian safety and accessibility through the implementation of measures that would minimize or avoid vehicular/pedestrian and vehicular/bicycle conflicts. Design elements of the streetcar system may include, but would not be limited to, the following: streetcars equipped with lighting and audible warning devices, TWC, signage, striping, and wayfinding. Operators would also develop transit safety programs, with the goal of raising streetcar safety awareness in the community.

ES.6 Construction

Construction would begin in 2019 and occur over 24 months, including testing activities. Construction equipment required for the Project would typically include backhoes, small cranes, dump trucks, concrete trucks, paving equipment, rail transporters, bulldozers, graders, cranes, compactors, rollers, drill rigs, paving machines, rail welding equipment, concrete mixers, flatbed trucks, dump trucks to haul dirt, rail installation vehicles, and various hand and power tools. Additional details are included in Section 4.15, Construction, related to:

- Utility Relocation
- Track Construction
- MSF Construction
- Platform Construction
- Operating Systems Installation
- Testing and Start-Up

Project construction activities would typically take place on weekdays between 7:00 a.m. and 9:00 p.m., in accordance with Los Angeles Municipal Code (LAMC) Section 41.40(a). To expedite construction, certain construction activities may occur during nighttime, weekend, and holiday periods with the approval of the Board of Police Commissioners pursuant to LAMC Section 41.40(j). In addition, construction within City roadways may occur during peak periods (i.e., 6:00 a.m. to 9:00 a.m. and 3:30 p.m. to 7:00 p.m.) in accordance with Mayor's Executive Directive No. 2 and BOE Special Order No. 001-0406, which provide an exemption to the rush hour roadway construction prohibition for major public works projects having traffic mitigation plans.

The phasing of specific construction activities is not known at this time. It is anticipated that the installation of operating systems along with testing and start-up would occur in the final six months of the schedule. In addition, it is anticipated that the Request for Proposals related to vehicle
procurement will be released in 2018 and notice-to-proceed issued to the vehicle manufacturer will occur in 2019. Vehicles would arrive starting in 2021 with the final vehicle arriving in 2022.

**ES.7 Operations and Ridership**

The currently proposed operating plan assumes that the streetcar system would operate 7 days a week with an estimated three to six streetcars running at any given time. The average run time for a round trip would be approximately 35 to 40 minutes with headways of approximately 7 minutes at a given location during morning and evening peak hours. During non-peak mid-day hours, an estimated four vehicles would be in operation, with headways of approximately 10 minutes. During non-peak evening hours, an estimated three vehicles would be in operation, with headways of approximately 15 minutes. Hours of operation would be 6:00 a.m. to 12 midnight, Monday through Thursday; 6:00 a.m. to 2:30 a.m. on Friday; 9:00 a.m. to 2:30 a.m. on Saturday; and 9:00 a.m. to 12 midnight on Sunday and holidays.

Ridership was forecast using the FTA tool for estimating transit ridership: the Simplified Trips-On-Project Software (STOPS) Model, Version 2.0. The results are shown in Table ES-1.

**Table ES-1. Daily Ridership Estimates**

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<tr>
<td>Project with Grand Avenue Extension Design Option</td>
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<td>7,760</td>
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</table>


a The ridership forecast was prepared assuming streetcar operations would begin in late 2020. It has been determined that operations would now begin six months later than previously assumed for the Project resulting in a 2021 opening date. Nevertheless, the ridership forecast considered both ridership and vehicle miles traveled (VMT) reductions through the year 2040, and indicated that both ridership and VMT reductions would increase throughout that period. A six-month delay in the opening date does not substantially alter this analysis.

**ES.8 Project Cost**

Capital and operating and maintenance (O&M) costs have been estimated for the Project without and with the Grand Avenue Extension Design Option. Capital costs are estimated to be $290.7 million for the Project and an additional $15.6 million for the Grand Avenue Extension Design Option (2016 dollars). Annual O&M costs are estimated to be $6.618 million for the Project and $6.639 million for the Project with the Grand Avenue Extension Design Option.

**ES.9 Environmental Effects**

This EA analyses potential environmental and socioeconomic effects of the Project and the No Build Alternative. The No Build Alternative represents future conditions if the Project was not built. Environmental factors potentially affected by the Project and analyzed in this EA are shown in Table ES-2 along with potential adverse effect determinations and measures to minimize potential harm.
## Table ES-2 Summary of Potential Effects

<table>
<thead>
<tr>
<th>Resources Area</th>
<th>Assessment Topics</th>
<th>Potential Effect Determination</th>
</tr>
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<tbody>
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<td>Hazardous Materials (Operations)</td>
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<td>Wild and Scenic Rivers</td>
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<td>Effect EJ-5: Visual Quality</td>
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### Executive Summary

**Restoration of Historic Streetcar Service in Downtown Los Angeles**

#### Potential Effect Determination

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<tr>
<th>Resources Area</th>
<th>Assessment Topics</th>
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The Project would result in beneficial effects related to operational air quality, energy, and GHG emissions. Potential noise and safety adverse effects would be substantially reduced with implementation of avoidance, minimization, or mitigation measures detailed below. All other resource areas would not result in adverse effects or potential adverse effects would be eliminated with avoidance, minimization, or mitigation measures.

**ES.10 Measures to Minimize Harm**

The avoidance, minimization, and mitigation measures presented here have been incorporated into the Project and would reduce potentially adverse effects.

**Operations**

**Cultural Resources**

**CUL-O1:** The City of Los Angeles shall ensure that design and installation of all project facilities and elements that are adjacent to or abutting historical resources or within a historic district will be consistent with the surrounding design context. The appropriateness of the design will be achieved through consultation with and approval by the City of Los Angeles Office of Historic Resources, applying the Secretary's Standards. Project facilities and elements shall be designed for consistency and installed to the satisfaction of the City Engineer and will be in compliance with the *Historic Downtown Los Angeles Design Guidelines* and the *Broadway Streetscape Master Plan*, as applicable. LABOE shall be the responsible party. LABOE shall consult on the design with the City of Los Angeles Office of Historic Resources. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**Land Acquisition, Displacement, and Fiscal Impacts**

**ECON-O1: Business Displacement.** Proposed displacement of the Guadalupe Wedding Chapel and any other businesses subject to displacement as a result of the Project would occur in accordance with applicable laws and regulations, including the *Uniform Business Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as mentioned. Compensation to the property owner and business operators and relocation assistance would be provided.

**Land Use and Zoning**

**RCM-LU-O1: Downtown Design Guidelines.** Design of the Project would comply with all applicable guidelines and requirements included in the *Downtown Design Guidelines* and Public Benefit projects performance measures, if necessary.

**LU-O1: LAMC Public Benefits Projects Conformity.** The Project shall adhere to the requirements of LAMC Section 14.00 in all respects and shall follow all applicable procedures. All applicable performance standards or alternative compliance measures shall be addressed and all procedures for review and approval shall be followed. The City of Los Angeles BOE shall ensure the carrying out of the mitigation measure.
Noise and Vibration

NV-01: At vicinity of Disney Concert Hall; the contractor shall install a “low impact” frog, such as a “well designed” flange bearing frog with a ramp angle between 1:20 and 1:100, for special trackwork as well as wheel dampers if wheel squeal occurs. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-02: The contractor shall use a “low impact” frog, such as a “well designed” flange bearing frog with a ramp angle between 1:20 and 1:100, for all special trackwork within the MSF. Rail lubricators shall be installed at all tight radius curves within the MSF to reduce and control wheel squeal. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-03: During pre-revenue testing, noise measurements shall be taken at the TPSS units to confirm compliance with the Contract Specification noise level limit of 50 dBA at 50 feet from any side of the TPSS unit. Should exceedances of the noise level limit be found to occur, mitigation options shall be identified and considered, including housing shielding or other suitable methods.

NV-04: If the track would be less than 1 foot from any part of a building foundation, mitigation measures, such as a resilient mat installed under the trackbed or comparable design measure, would be used. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

Safety and Security

TRAFF-01: Mitigation to be considered would include:

- Signage and pavement markings to alert bicyclists to the presence of streetcar tracks.
- Instruct cyclists to cross tracks perpendicular to the direction of the rails. For left-turning cyclists, pavement markings shall be provided to encourage perpendicular bicycle turning movements, such as “Copenhagen Left” turns.¹ The signage and/or pavement markings would also clearly identify the presence of the flangeway to cyclists traveling parallel to the fixed guideway.
- Alert bicyclists to use parallel bike routes (or Class II bike facilities) where available, such as Spring Street as an alternative to southbound Broadway.
- Recommend alternate routes.

¹ A Copenhagen Left turn is a two-staged left turn wherein the bicyclist crosses the intersection ahead, stops on the opposite side in the direction he/she wishes to turn, awaits a green light, and crosses the intersection to complete the left turn.
Visual Quality

**AES-O1: Design of Traction Power Substation Structures.** The City of Los Angeles shall ensure that all TPSS structures would be designed to minimize their visual presence. Where site and design allow, the TPSS structures shall incorporate design and location features, such as the minimization of the size of the structures, setbacks from adjoining street frontages, screening, and/or architectural treatments that are appropriate to the design setting where visible from the public right-of-way at street level. All TPSS structures shall be designed and built to satisfy the established final design requirements and in compliance with all applicable design guidelines, policies, and development standards, including required Public Benefit performance measures, if necessary. Should a TPSS be located within the public right-of-way, it shall be designed in conformance with the Los Angeles Above-Ground Facility regulations contained in Section 62.08 of the LAMC. LABOE shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**AES-O2: Maintenance Storage Facility Design and Operational Lighting.** The City of Los Angeles shall ensure that the MSF site plan, building treatments and architecture would be appropriate in scale, proportion, and detail with appropriate use of material, texture, articulation, and color in consideration of the surrounding design context. The aesthetic treatment shall be designed and built in compliance with all applicable design guidelines, policies, and development standards. Light associated with the MSF shall be properly controlled and directed on site in a manner that would minimize the potential for spill light. The Project would adhere to the requirements of LAMC Section 14.00 in all respects and will follow all applicable procedures. All applicable performance standards or alternative compliance measures will be addressed and all procedures for review and approval will be followed. LABOE shall ensure the carrying out of the mitigation measure.

**AES-O3: Overhead Contact System Poles.** The City of Los Angeles shall ensure that design and installation of the OCS poles will be consistent with the surrounding design context. OCS poles shall be designed and installed in compliance with all applicable design guidelines, policies, and development standards. LABOE shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

Construction

Air Quality

**AQ-C1: Use cleaner-burning off-road construction equipment per the following schedule:** The contractor shall ensure that all off-road diesel-powered construction equipment greater than 50 horsepower (hp) shall meet the Tier 4 emission standards. In addition, all construction equipment shall be outfitted with best available control technology (BACT) devices certified by ARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by ARB regulations. The City of Los Angeles Department of Public Works, Bureau of Engineering, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the Department of Public Works Contracts Administration Bureau Construction Inspector.
**Biological Resources**

**BIO-C1: Tree Removal/Relocation.** Should mature trees, as well as younger trees (with trunk diameters of 5 inches at breast height or less) be trimmed or removed, the proposed Project would comply with the *City of Los Angeles Tree Preservation Ordinance* and *Tree Preservation Policy*. City policy requires all tree removals be replaced on a 2:1 basis for street trees and 4:1 basis for protected private property trees. No protected trees were identified throughout the proposed alignment and at the potential MSF siting locations. Replacement trees would be placed as near their original locations as possible. Alternative methods and options to removal, such as trimming, would be explored prior to considering potential tree removal. The Project’s compliance with the *City of Los Angeles Tree Preservation Ordinance* and *Tree Preservation Policy* would ensure that any street trees slated for removal would be planted at or near their original locations at 2:1 ratios. Removal or relocation of protected trees, under the City's *Tree Preservation Ordinance*, requires a permit from the Board of Public Works. A protected tree report must be submitted to the Board of Public Works to apply for a tree removal permit. Before a Special Habitat Value tree, as defined by the City's *Tree Preservation Policy*, is pruned, damaged, relocated, or removed, recommendations from the Department of Public Works, Bureau of Street Services, Urban Forestry Division must be obtained. The Urban Forestry Division makes a recommendation to the Board of Public Works for removal. The Board of Public Works must make the final approval before the trees(s) can be removed.

**Cultural Resources**

**CUL-C1: As part of final design, a detailed field survey shall be conducted to identify historic sidewalk features that need to be avoided, protected during construction, or altered in conformance with the Secretary's Standards.** Conditions to protect the historic sidewalk features and preserve the material in place during construction will be required. Historic sidewalk features should be covered with a protective material to avoid scratches and staining from adjacent construction work. OCS poles will not be installed in terrazzo installations or vault lights. Sidewalk ramps will be designed or located to avoid physical damage or alteration of historic sidewalk features. The existing concrete curb will not be removed at bump out areas in order to protect the historic sidewalk feature from being saw cut or from cracking. Design drawings will be made available to contractors during construction, which will identify historic sidewalk features. These measures will reduce the potential to alter or cause physical damage to historic sidewalk features, and therefore avoid, minimize, or mitigate adverse changes to the historic district, individually significant resources or features that contribute to designated resources. Should incidental damage occur during construction to any historic sidewalk feature, it would be repaired or replaced in kind by a qualified contractor in a manner consistent with the Secretary’s Standards. In the unlikely event that a damaged sidewalk feature could not be treated in accordance with the Secretary’s Standards, compliance with the Secretary’s Standards to the maximum extent feasible would be undertaken. Even in such an event, there would still be no adverse impact on any historic buildings, districts, or any other designated historic resources because enough contributing features would remain so that the historical resource at issue would remain eligible as a historic resource. If any historic features cannot be restored in conformity with the Secretary’s Standards, the Contractor shall immediately cease action and contact the Engineer, as well as FTA, who will in turn consult directly with SHPO to determine appropriate next steps.
CUL-C2: If discovery is made of items of archaeological or paleontological interest, the Contractor shall immediately cease excavation in the area of discovery and notify the Engineer and FTA. Work shall not continue until ordered by the Engineer. When resumed, excavation operations within the area of discovery shall be as directed by the Engineer. Discoveries which may be encountered may include, but not be limited to, dwelling sites, stone implements or other artifacts, animal bones, human bones, and fossils. Discoveries without prior planning would follow the federal process and requirements set forth in the Section 106 regulations at 36 CFR § 800.13 (b).

Geology, Soils, and Seismicity

GEO-C1: In order to ensure that utility relocation, track-laying activities, and MSF construction do not result in a substantially increased risk of soil instability, temporary shoring shall be used for lateral support, and properly compacted fill soils or cement slurry shall be used for excavation backfill. A geotechnical report shall be prepared during the design phase, subject to approval by the City, that will address the following topics, and will also recommend specific design specifications, which may include, but are not limited to:

• **Liquefaction and Lateral Spreading:** Methods for construction in areas with a potential liquefaction hazard may include in situ ground modification, removal of liquefiable layers and replacement with compacted fill, or support of project improvements on piles at depths designed specifically for liquefaction. Pile foundations can be designed for a liquefaction hazard by supporting the piles on dense soil or bedrock located below the liquefiable zone or employing other appropriate methods, as evaluated during the site-specific evaluation. Additional recommendations for mitigation pertaining to liquefaction may include densification by installation of stone columns, vibration, deep dynamic compaction, and/or compaction grouting.

• **Structural Support:** Recommendations will be made related to the methods of construction of the MSF in proximity to existing buildings, such as buffer distances to maintain from existing buildings or structural supports for these buildings during the construction period.

The construction contractor shall implement all recommendations from this report into the work plan. The City of Los Angeles Department of Public Works, Bureau of Engineering, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the Department of Public Works Contracts Administration Bureau Construction Inspector.

Hazardous Materials

HM-C1: During construction, a focused PSI shall be conducted at specified locations adjacent to the identified sites of concern with moderate, high, and indeterminate risks as well as the proposed locations for the MSF and TPSSs. A PSI in these areas shall include a soil boring and laboratory analytical program to address contaminants of concern specific to each site. Soils that have visible staining or an odor shall first be tested in the field by the contractor or qualified environmental subcontractor with an organic vapor analyzer (OVA) or other field equipment for volatile components, which require additional considerations in their handling. Soil with OVA readings exceeding 50 ppm for VOCs (probe held 3 inches from the excavated soil face), or that is visibly stained or has a detectable petrochemical odor, shall be stockpiled by the contractor separately from non-contaminated soils. The stockpiles shall be barricaded near the excavation.
area, away from drainage areas or catch basins, on an impermeable plastic liner (6-millimeter nominal thickness and tested at 100 pounds per square inch). Caution must be taken to separate any contaminated soil from the remainder of the excavated material. If only a small amount of contaminated soil is encountered, it may be drummed in 55-gallon steel drums with sealing lids. The DPW Bureau of Engineering (BOE), through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

HM-C2: Soil shall be sampled in a random and representative manner. To establish waste classification, samples shall be analyzed for total recoverable petroleum hydrocarbons (TRPH), VOCs, and total petroleum hydrocarbons (TPH) as gasoline or diesel if these fuels are found in the area, Title 22 heavy metals, reactivity (pH), corrosivity, and toxicity. The number of samples shall depend on the volume of material removed, with one sample for approximately every ton of soil. Storage space available at the site and neighborhood sensitivity shall determine the amount of soil that can be stockpiled. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

HM-C3: If VOCs are present at concentrations exceeding 50 ppm, a permit from the South Coast Air Quality Management District shall be required, which most likely shall require control of vapor, such as covering the stockpiles with plastic sheeting or wetting with water or a soap solution. The contractor shall obtain all necessary permits. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

HM-C4: During construction, suspected contaminated soil samples shall be taken to a state-certified environmental laboratory or tested in the field with a mobile lab and technician using infrared spectrometry in accordance with appropriate testing methods. Materials with elevated levels of TRPH, metals, or other regulated contaminants shall require handling by workers who have been adequately trained for health and safety aspects of hazardous material handling. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

HM-C5: Any contaminated material (soil, asphalt, railroad ballast, concrete, or debris) that is to be hauled off-site and is considered a "waste product" shall be classified as hazardous or nonhazardous waste under all criteria by both state and federal codes prior to disposal. If the waste soil or other material is determined hazardous, a hazardous waste manifest shall be prepared by the contractor or its qualified representative and the material transported to an appropriate class of facility for recycling or landfill disposal by a registered hazardous material transporter. If the soil is nonhazardous but still exceeds levels that preclude its return to the excavation, a less-costly nonhazardous transporter and soil recycling facility shall be used if no hazardous constituents are present above their respective action levels. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

HM-C6: At the start of construction, all construction contractors shall be instructed to immediately stop all subsurface activities in the event that potentially hazardous materials are encountered, an odor is identified, or significantly stained soil is visible. Contractors shall be instructed to follow all applicable regulations regarding discovery and response for hazardous
materials encountered during the construction process. Furthermore, hazardous waste generated by the contractor at the site shall be disposed of in accordance with the City’s Notification of Hazardous Substances General Conditions in the construction contract. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**HM-C7:** In the event groundwater is encountered during construction, dewatering shall be minimized to that required for removing interior or nuisance water from structures. Sampling ports shall be provided in the dewatering system. The produced water shall be required to be temporarily stored in large Baker-type tanks and analyzed by a state-certified environmental laboratory selected by the contractor. If the groundwater quality falls within guidelines established by the DPW, Bureau of Sanitation, a permit shall be obtained to discharge the water into a nearby sewer. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**HM-C8:** During construction, if hydrocarbon or other water contamination precludes the measures in HM-C7, the contaminated groundwater shall be treated on site (such as in an oil-water separator) or hauled off site for treatment and disposal in accordance with applicable regulations by a licensed professional. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**Land Acquisition, Displacement, and Fiscal Impacts**

**ECON-O1: Business Displacement.** Proposed displacement of the Guadalupe Wedding Chapel and any other businesses subject to displacement as a result of the Project would occur in accordance with applicable laws and regulations, including the **Uniform Business Relocation Assistance and Real Property Acquisition Policies Act of 1970**, as mentioned. Compensation to the property owner and business operators and relocation assistance would be provided.

**ECON-C1: Business Access and Signage.** The construction contractor shall provide signs for businesses whose frontage is obstructed by construction work indicating that the business is open during construction, and provide information regarding access to the business.

**Noise and Vibration**

**NV-C1:** The contractor shall limit nighttime construction activities (during the hours from 10:00 p.m. to 7:00 a.m.) to generate lower noise levels, which may include, but not be limited to, concrete pouring, field welding, and underground utility work. The City of Los Angeles Department of Public Works (DPW), Bureau of Engineering (BOE), through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-C2:** The contractor shall use specialty equipment with enclosed engines and/or high-performance mufflers. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.
NV-C3: The contractor shall locate equipment and staging areas as far from noise-sensitive receivers as practicable. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C4: The contractor shall limit unnecessary idling of equipment. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C5: The contractor shall install temporary noise barriers to enclose stationary noise sources, such as compressors, generators, laydown and staging areas, and other noisy equipment. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C6: The contractor shall reroute construction-related truck traffic away from residential buildings to the extent practicable. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C7: The contractor shall sequence the use of equipment so that simultaneous use of the loudest pieces of equipment is avoided as much as practicable. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C8: The contractor shall avoid the use of impact equipment and, where practicable, use non-impact equipment. Non-impact equipment could include electric or hydraulic-powered equipment rather than diesel and gasoline-powered equipment where feasible. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C9: The contractor shall use portable noise control enclosures for welding in the construction staging area. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C10: If a noise variance from Section 41.40(a) of the Los Angeles Municipal Code is sought, a noise limit shall be specified. The contractor shall employ a combination of the above-listed noise-reducing approaches to meet the noise limit. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C11: Specific measures to be employed to mitigate construction noise impacts shall be developed by the contractor and presented in the form of a Noise Control Plan. The Noise Control Plan shall be submitted for review and approval before the beginning of construction activities. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.
NV-C12: A preconstruction survey shall be conducted, including an inspection of building foundations and photographs of pre-existing conditions. The survey can be limited to (a) the first row of buildings along the selected alignment and will include the locations of the glass blocks and associated subterranean vaults and (b) buildings within approximately 200 feet of the construction zone that are deemed to be extremely susceptible to vibration, as determined by local authorities. These will be included in the survey.

The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C13: Per the FTA Guidance Manual, construction vibration shall be limited to the PPV, ranging from 0.12 inch per second for “buildings identifiable as being extremely susceptible to vibration damage” to 0.5 inch per second for “reinforced concrete, steel, or timber” buildings. The contract specifications shall establish appropriate damage risk vibration limits for historic properties within 200 feet of construction. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C14: The contractor shall be required to monitor vibration at any building where the lower vibration limit is applicable and at any location where complaints about vibration are received from building occupants. This shall include “special” land uses, such as the Disney Concert Hall and the Colburn School. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C15: If the contractor’s plan calls for high-vibration construction activities being performed close to structures, the contractor may be required to use alternative procedures that produce lower vibration levels. Examples of high-vibration construction activities include the use of pavement breakers, vibratory compaction, and hoe rams next to sensitive buildings. Alternative procedures shall include the use of non-vibratory compaction in limited areas and concrete saws in place of jackhammers or pavement breakers for demolition. To avoid potential interference with “special” land uses caused by construction vibration, the contractor shall be required to coordinate with building owners to limit high-vibration construction activities to times when sensitive activities are not occurring inside the buildings. For example, the contractor could avoid the use of high-vibration construction equipment during a scheduled performance or recording at the Disney Concert Hall. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C16: The Contractor shall hire a Noise and Vibration Mitigation Coordinator to provide notice to venues and sound-sensitive land uses along the corridor at least two weeks in advance of construction activities. The role of the Mitigation Coordinator (N&VMC) will be to respond to concerns related to implementation of construction-related mitigation measures. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.
Transportation and Traffic

**TRAF-C1: Develop a Construction Traffic Management Plan.** The Los Angeles Department of Transportation (LADOT) shall develop and implement a Traffic Management Plan (TMP) to reduce construction-related traffic impacts on public services, community facilities, utilities, bicycle circulation, and pedestrian circulation. The TMP shall be prepared during final design for implementation during construction to mitigate the traffic impacts caused by construction of the Project. The TMP shall identify potential measures such as public awareness and changeable message signs. The TMP shall be developed in consultation with emergency service providers (i.e., local police and fire departments).

The TMP shall address construction duration and activities and include measures such as a temporary traffic signal, bicycle lane detours, or flagmen adjacent to construction activities. The TMP shall also coordinate review of construction activities along cross and parallel streets accordingly. A community affairs entity shall be established to administer a construction impact mitigation program for the benefit of the community. This program shall keep the community informed of all construction activities, with special emphasis on activities that affect the public. The program shall also set up a hotline number with a direct connection to staff familiar with the community and the Project. This entity shall offer individual consultation for residents, facilities, and businesses for remedies appropriate to the impacts encountered. The program shall identify community/business needs prior to and during the construction period through the use of surveys and community meetings. LADOT and the City of Los Angeles Department of Public Works, Bureau of Engineering (LABOE), through the construction contractor per bid specifications, shall be the responsible party. Access to businesses will be maintained during construction. Enforcement shall be achieved through the City of Los Angeles Department of Public Works Contracts Administration Bureau Construction Inspector.

**TRAF-C2: Construction Mitigation Monitoring.** A construction mitigation program shall be established with participation of City of Los Angeles Department of Public Works, Bureau of Engineering (LABOE), Bureau of Contracts Administration, and the construction contractor. All mitigation measures shall be monitored and reported to LABOE on a quarterly basis. The Los Angeles Department of Transportation and LABOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the City of Los Angeles Department of Public Works Contracts Administration Bureau Construction Inspector.

Visual Quality

**AES-C1: Construction Staging/Stockpiled Materials and Equipment.** Under the direction of the LABOE, the construction contractor shall be the responsible party for providing temporary construction fencing along the periphery of active construction areas to screen as much of the construction activity as possible from view at the street level.

To minimize views of stockpiled materials and idled construction equipment in staging areas and to reduce visual clutter and disorder, consistent with Bureau of Engineering Master Specification Environmental Control Measures, project construction staging areas shall be enclosed or screened from view at the street level with appropriate screening materials. The contractor shall provide daily visual inspections to ensure that the immediate surroundings of construction staging areas are free from construction-related clutter and graffiti and maintain the areas in a clean and orderly manner throughout the construction period. Graffiti shall be
promptly painted over, masked out, or cleaned off. Routine sidewalk and window washing to remove dust generated by construction shall be scheduled weekly. LABOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contract Administration Bureau Construction Inspector.

**AES-C2: Nighttime Construction Activities.** Should construction activities with associated lighting occur during nighttime, the City shall ensure that lighting will be directed away from surrounding sensitive land uses and toward the specific location intended for illumination. Lighting associated with construction activities and security purposes shall be shielded to minimize the production of glare and spill light around sensitive land uses in the surrounding area. LABOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**AES-C3: Tree Removal/Relocation.** Should mature trees, as well as younger trees (with trunk diameters of 5 inches at breast height or less) be trimmed or removed, the proposed Project would comply with the City of Los Angeles Tree Preservation Ordinance and Tree Preservation Policy. City policy requires all tree removals be replaced on a 2:1 basis for street trees and 4:1 basis for protected private property trees. No protected trees were identified throughout the proposed alignment and at the potential MSF siting locations. Replacement trees would be placed as near their original locations as possible. Alternative methods and options to removal, such as trimming, would be explored prior to considering potential tree removal. The Project’s compliance with the City of Los Angeles Tree Preservation Ordinance and Tree Preservation Policy would ensure that any street trees slated for removal would be planted at or near their original locations at 2:1 ratios. Removal or relocation of protected trees, under the City’s Tree Preservation Ordinance, requires a permit from the Board of Public Works. A protected tree report must be submitted to the Board of Public Works to apply for a tree removal permit. Before a Special Habitat Value tree, as defined by the City’s Tree Preservation Policy, is pruned, damaged, relocated, or removed, recommendations from the Department of Public Works, Bureau of Street Services, Urban Forestry Division must be obtained. The Urban Forestry Division makes a recommendation to the Board of Public Works for removal. The Board of Public Works must make the final approval before the trees(s) can be removed.
Chapter 1.0
Introduction

1.1 Purpose of this Document

The purpose of this EA is to inform decision-makers and the general public of potential adverse effects that could result from construction and operation of the Project. This EA has been prepared pursuant to NEPA of 1969 (42 United States Code (U.S.C.) 4321-4347), the Council on Environmental Quality (CEQ) NEPA implementing regulations (40 Code of Federal Regulations (CFR) Sections 1500-1508), and the NEPA implementing procedures of the FTA (23 CFR Part 771).

1.2 Project Sponsors

FTA is the federal lead agency for the Project. The City is the local lead agency for the Project. Development of the Project and its environmental review process are being managed through the joint cooperation of LADOT, LABOE, and Metro. Additional support is being provided by City Council District 14 and LASI, an independent non-profit agency.

1.3 Public Review of the EA

The Notice of Availability for a 30-day public review has been made through display advertisements placed in the Federal Register and the Los Angeles Downtown News (print and digital versions). The Project is located in City Council District 14, which is represented by City Councilmember Jose Huizar. A press release was prepared and sent to City Councilmember Jose Huizar’s office for distribution to the media. The release was also sent to individuals and organizations known to have interest in the Project, or type of project, and local bloggers. The EA is being circulated for review and comment by the public and other interested parties, agencies, and organizations for 30 calendar days starting July 23, 2018 and ending on August 21, 2018. The EA is available at the following locations.

- City of Los Angeles, Department of Public Works, Bureau of Engineering, Environmental Management Group, 1149 South Broadway, 6th Floor, CA 90015. Contact: William Jones at (213) 485-5760, fax: (213) 847-0656
- Los Angeles Central Public Library, 630 West 5th Street, Los Angeles, CA 90071
- Little Tokyo Branch Library, 203 South Los Angeles Street, Los Angeles, CA 90012
- Project website—http://eng.lacity.org/historic_streetcar

All documents referenced in the EA are available for review (either as included in the Reference Library CD and/or provided by request as directed to William Jones at LABOE).

To receive local public input and comment on this EA, LABOE will hold a public hearing on August 2, 2018 at 100 South Main Street, Los Angeles, CA 90012, to give an overview of the Project and solicit comments on this EA.
Comment can be provided at the hearing and written comments can be provided from July 23 through August 21, 2018. Written comments should be provided to:

City of Los Angeles, Department of Public Works
Bureau of Engineering, Environmental Management Group
1149 South Broadway, 6th Floor
Los Angeles, CA 90015
Attention: William Jones
eng.lastreetcarproject@lacity.org

1.4 Comment Period and Next Steps

Following close of the comment period, FTA and the Project sponsors will thoroughly consider any comments submitted. Based on information contained in this EA and any comments submitted, FTA will determine whether environmental effects are sufficiently substantial to warrant preparation of an Environmental Impact Statement. If the FTA decides that there are no adverse effects, it will prepare and sign a Finding of No Significant Impact (FONSI). The determination will be made available to the general public and all who commented on this EA.

1.5 Organization of the EA

This EA conforms to the content requirements of NEPA. A list of the chapters and a brief description of their content is provided here to assist the reader in locating information.

Executive Summary: The Executive Summary provides a brief description of the Project, including an overview of the NEPA analysis and measures to minimize harm. Summary information regarding the Project and key conclusions is also provided.

Chapter 1 Introduction: This chapter provides a general orientation regarding the purpose of the document, project sponsors, and includes information on scoping for the EA, availability of documents, and the review process.

Chapter 2 Purpose and Need: This chapter presents the Project location, Project history and background, and purpose and need.

Chapter 3 Alternatives: This chapter describes the Project alternatives, cost, and ridership. This chapter also summarizes the alternatives development and selection of the LPA by the City of Los Angeles.

Chapter 4 Affected Environment/Environmental Consequences: This chapter analyzes potential impacts under NEPA from implementation of the Project. The impact discussion is organized into topical issues that have the potential to result in adverse effects.

Chapter 5 Public and Agency Coordination: This chapter details the public outreach process associated with the Project.

Chapter 6 References, Organizations and Persons Consulted: This chapter lists all the references and sources used in the preparation of this EA.

Chapter 7 List of Preparers: This chapter lists the persons who prepared this EA.
Chapter 2.0
Purpose and Need

2.1 Project Location

The Project is located in downtown Los Angeles, California. The Project route covers an area composed primarily of commercial land uses with a mix of residential, public, and commercial land uses. The Project would link several neighborhoods or districts within downtown Los Angeles including: Civic Center, Bunker Hill, Historic Core, Jewelry District, Financial Core, South Park, Fashion District, and LA Live/Convention Center. This dense urban area is the region’s largest employment center and one of the region’s largest tourist destinations. Also, the downtown Los Angeles resident population has grown to over 52,000 residents with 6,880 new residents between 2011 and 2013, and 23,520 new residents from 2006 to 2013 (Downtown Center Business Improvement District 2013).

The Project alignment would begin at Hill and 1st Streets, run east along 1st Street, south along Broadway, west along 11th Street, north along Figueroa Street, east along 7th Street, and north along Hill Street, back to its beginning at 1st Street. Potential inclusion of a Grand Avenue Extension would also provide a two-way alignment spur west along 1st Street, beginning at Hill Street, and continuing south along Grand Avenue to a stop north of 2nd Street. Figure 2.1-1 shows the regional location of the Project. Figure 2.1-2 shows the Project’s routing within downtown Los Angeles.

2.2 Project History and Background

At one time, the streetcar network in Los Angeles extended more than 600 miles of the metropolitan area; by the 1920s, it was the largest trolley system in the world (Metro 2012). Over a period of years, service was gradually discontinued, one route at a time, and by 1963, diesel buses had replaced the entire streetcar system. In more recent years increasing traffic congestion and worsening environmental impacts have resulted in a renewed interest in new forms of mass transit. Developing a streetcar system in downtown Los Angeles is part of this effort.

Restoration of downtown streetcar service is an idea that has been considered for over a decade by Metro, as well as the former CRA/LA, and the former Central City Association Red Car Advisory Committee. Advocacy groups such as LASI and members of Council District 14’s “Bringing Back Broadway” initiative have also been important drivers of the effort. Beginning as a concept aimed at tourism, research and outreach conducted over the past 15 years has resulted in a project geared toward promoting community revitalization, reactivating historic resources, and supporting general economic development in downtown Los Angeles, in addition to creating a new, easily accessible transit opportunity for the downtown area. In 2006, CRA/LA finalized the Feasibility Study for the Resurrection of the Red Car Trolley Services in the Los Angeles Downtown Area, which analyzed various alignment concepts, determined the feasibility of restoring the streetcar system, and identified engineering considerations, ridership estimates and needs, potential costs of implementing the streetcar, and potential funding sources (CRA/LA 2006).
Figure 2.1-1. Regional Location Map
Figure 2.1-2. Proposed Downtown Los Angeles Streetcar Route
As contracted by CRA/LA, Metro moved the development process forward and assisted CRA/LA with the *Restoration of Historic Streetcar Service in Downtown Los Angeles Alternatives Analysis*, which was completed in January 2012 (Metro 2012). That document analyzed a multitude of potential alignments in its initial screening process, leading to the development of seven feasible alternatives. Those alternatives were then evaluated across a variety of factors, including capital and operating cost, design constraints, service area, connections to transit and other modes of transportation, environmental impacts, and economic development opportunities. A final screening analysis identified 7th Street, which was designated at that time by the CRA/LA Board of Commissioners and the City Council as the LPA, for further environmental analysis. The 7th Street Alignment Alternative (see description below) was selected because of favorable ridership estimates, a high combined average of daily boardings, and total boardings per mile; low capital, operating, and maintenance costs; and local community support. In addition to the LPA, a second concept that would use 9th Street instead of 7th Street between Figueroa Street and Hill Street was identified as part of this process to account for vehicle lane reductions along 7th Street implemented by Los Angeles Department of Transportation (LADOT as part of the *2010 Bicycle Master Plan* (DCP 2011)). The 9th Street Alternative was therefore included to provide an alternative to address potential traffic impacts that could occur on 7th Street.

In accordance with CEQA, the City assessed multiple alternatives in an EIR. The EIR considered 7th and 9th Streets streetcar alignments, four MSF sites, and various station platform and TPSS locations. The CEQA process was completed on November 29, 2016 when the City Council certified the Final EIR and adopted the Findings of Fact and the Statement of Overriding Considerations along with the Mitigation Monitoring and Reporting Program. The City, in cooperation with LASI and Metro, adopted the Project or LPA, as:

- 7th Street Alternative without a Grand Avenue Extension
- Grand Avenue Extension as an optional addition to the Project, if additional funding can be identified
- MSF to be located at Broadway and 2nd Street or 11th Street/Olive Street (East)
- Station platform locations to be determined as final design of the Project proceeds
- TPSS locations to be determined as final design of the Project proceeds

### 2.3 Purpose

The primary purpose of the Project is to enhance mobility through expanded transit circulation service and support the growth and revitalization of downtown Los Angeles. By connecting residential and employment areas, shopping districts, civic resources, cultural institutions, historic districts and landmarks, and entertainment venues, and by providing connectivity to other transit services, the Project would improve mobility and accessibility with a new transportation mode for people who live and work in the downtown area, as well as for visitors.

The Project is intended to fulfill the following objectives:

- **Land Use and Economic Development**: Support the growth and revitalization of downtown Los Angeles, including its historic districts, through the following:
  - Revitalize geographically isolated, underutilized areas.
  - Promote smart, sustainable growth that helps to reduce sprawl.
o Implement transit policies that support the City's General Plan.
o Integrate transit and land use within the study area.
o Encourage historic restoration and transit-oriented development.
o Strengthen downtown's economic competitiveness.
o Foster a more livable downtown.
o Create a distinctive tourist draw that would expand the economic base of the City and maximize tax revenue.
o Improve transit access to existing and planned developments.
o Improve interconnectivity between residential areas, employment and activity centers, and retail services.
o Help to create a vibrant outdoor ambience that would attract residents and visitors to the streets of downtown Los Angeles.

● **Mobility:** Enhance mobility and transit circulation in downtown Los Angeles through the following:
o Connect major districts, destinations, and activity centers.
o Improve transit coverage and circulation.
o Provide easy to use, localized, high-frequency service.
o Serve transit-dependent populations.
o Improve transit accessibility and operational efficiency.

● **Congestion Relief:** Create pedestrian-oriented amenities interconnected with sidewalks and public space that will enhance downtown Los Angeles' distinct identity through the following:
o Reduce dependency on automobiles by implementing transit services and improving walkability.
o Increase mobility and accessibility for visitors and people who live and work in downtown.

● **Environmental Benefits:** Protect and improve aspects of the downtown core through the following:
o Preserve the area's historic significance and revitalize the Historic Core.
o Reduce automobile trips within downtown Los Angeles.

### 2.4 Need

The study area, as outlined in the Alternatives Analysis report (Metro 2012), is bounded by Cesar Chavez Avenue, Chinatown, and Union Station to the north; Washington Boulevard to the south; Los Angeles Street to the east; and the Harbor Freeway (Interstate 110) to the west. In evaluating the activity centers, districts, characteristics, demographics, and travel conditions within the study area, the following themes have emerged that reinforce the need for the Project:

● A topographically and geographically disconnected pedestrian network exists in the downtown area;
● There is a lack of an available centralized downtown transit route to complement DASH service;
• Increased demand for transit service is emerging from development and population, household, and employment growth in downtown that existing facilities cannot serve;
• Traffic patterns and parking demands both currently constrain intra-downtown mobility by automobile; and
• Underutilized land and historic buildings could be brought to higher and better uses if additional means of access were available.

The restoration of historic streetcar service in downtown Los Angeles would provide a convenient mode of transit, with frequent service on a simple route configuration. The streetcar’s easily understood route and ease of use would encourage ridership by residents, workers, and visitors within the downtown area. The Project would provide a direct and convenient means for local circulation, connecting to activity centers, parking, offices, and residences. With low floor-level or near-level boarding, the streetcar would improve transit accessibility for persons with mobility impairments, allowing them to board the streetcar without assistance or use of a bus kneeling feature or “flip-out” ramp.

The following sections discuss how the Project would meet the specific needs identified above.

2.4.1 Topographically and Geographically Disconnected Pedestrian Network

With downtown Los Angeles, size, topography, and the street grid make it difficult to make convenient walking connections between many of the activity centers and districts, which inhibits pedestrian circulation. For example, Bunker Hill, which is the commercial core of downtown Los Angeles, rises 90 to 120 feet above surrounding areas, creating steep grades (15 to 30 percent) that are difficult for pedestrians to navigate. The street grid similarly impedes pedestrian circulation. Blocks in downtown Los Angeles (650 by 400 feet, on average) are longer than most central business districts, compared with examples such as downtown San Francisco (300 by 300 feet) or downtown Portland, Oregon (225 by 225 feet). Interruptions in the grid network are common, which also inhibit pedestrian trips. The combined effect of these topographic and geographic factors means that many internal downtown trips exceed comfortable walking distances (typically 0.25 to 0.5 mile), inhibiting pedestrian circulation between districts such as from South Park to Grand Central Market (1.2 miles, approximately 25 minutes walking time, based on an estimated pace of approximately 3 miles per hour), the Jewelry District to Bunker Hill (0.6 mile, approximately 16 minutes walking time, including a 14 percent grade), or from the Pershing Square subway station to the Orpheum Theater (0.6 mile, approximately 13 minutes walking time).

2.4.2 Lack of Centralized Downtown Transit Route

There are a variety of transit services available within the downtown area, including heavy and light rail and bus service. However, with the lone exception of the DASH service, downtown transit services are designed to serve longer commute-based travel markets. Metro and other regional operators provide transit service in downtown Los Angeles, but this service relies on a grid-oriented network with dozens of regional lines that make local circulation difficult and complex. Metro operates about 50 bus routes in the study area. There are nine other transit operators within the study area. However, currently no single line ties together the major activity centers in downtown Los Angeles. With the exception of Metro, LADOT, Montebello Bus Lines, and Gardena Municipal Bus Lines, these transit operators run mostly peak commute hour, peak-direction commuter bus service in and out of the
The Regional Connector project (currently under construction) would provide accessibility and mobility to the Bunker Hill area, which would not be provided to other areas within downtown.

LADOT operates a local downtown-serving shuttle bus service (i.e., DASH) in the study area along five routes that serve defined sets of destinations. It should be noted that LADOT is restructuring its downtown routes to better serve a changing downtown. However, DASH currently does not tie together the activity centers in downtown that would be served by the proposed streetcar; shifting between multiple DASH lines would be required to access the various locations made available in a single trip by the Project. An enhanced local transit network is needed that would complement DASH service.

In addition, the Project would supplement and improve the efficiency of the rail and bus service by providing transit connections in downtown once passengers disembark from regional transit services, and by locating stops at shorter intervals at strategic locations near activity and transit nodes. The Project would augment existing bus and rail service by local circulator coverage that connects communities in the downtown area. The Project would add an important new transit alternative that would enhance the efficiency and effectiveness of existing transit services by connecting employment and commercial districts, tourist destinations, and residences along the Project Alignment that are otherwise not accessible via a single mode of transit. The combination of proposed streetcar service and existing transit service, particularly DASH, would provide frequency and reliability of service that would make midday travel by transit more efficient and attractive to users.

2.4.3 Increased Transit Demand from Development and Population, Household, and Employment Growth

Significant levels of growth have been occurring and are projected to continue in downtown Los Angeles during the next 20 years. The projected growth will generate greater travel demand for both local transit services and roadway capacity that will tax the current supply. Over the past decade, significant new commercial and residential development and associated population growth have occurred in downtown Los Angeles, which has increased the strain on the transportation system. As of 2015, downtown Los Angeles has a population of approximately 60,618 people, compared to 18,700 people in 1999, a population growth of approximately 44 percent. Approximately 35,449 units are located in downtown Los Angeles, an increase of approximately 49 percent since 1999. Currently, approximately 10,170 new housing units are under construction and 15,334 new housing units are in the planning stage. With the completion of the future development, residential units would rise to approximately 60,953 residential units (Downtown Center Business Improvement District 2016). In addition, approximately 2 million square feet of new commercial and 2,500 hotel rooms were under construction in 2015, adding to the already more than 800 restaurants, bars, retail, nightlife, and amenities that serve the downtown Los Angeles community.

According to estimates from the Southern California Association of Governments (SCAG), by 2035 the population of the study area is projected to grow by more than 10 percent, and employment is projected to grow by more than 6 percent. Furthermore, transit-dependent populations such as low-income individuals and the elderly are expected to increase by 18 and 34 percent, respectively, by 2035 (SCAG 2012a). This growth in development, population, and employment will increase the trips to/from and within downtown Los Angeles and place a strain on the local transportation system. The Project would provide additional transit service to assist in
accommodating the needs of projected population and employment growth in the study area that is projected to serve between approximately 4,100 and 5,800 riders per day by early 2021, with increased ridership in future years.

2.4.4 Traffic Patterns and Parking Demand

The combination of short trip lengths to destinations within downtown Los Angeles and normal commuter parking requirements creates a high demand for parking, and this, coupled with the fact that on-street parking is difficult to find, compounds mobility issues in parts of the study area. Because further projected growth will be concentrated in the downtown area, the Project, in addition to other transit services, is needed for shorter, local trips that connect residential areas, employment centers, and retail services. Users would be able to "park once" and circulate throughout downtown by using transit instead of making multiple short trips by automobile and parking in multiple on-street parking spaces. By augmenting the current local transit services in the downtown core, the Project would provide yet another opportunity for transit use rather than the automobile and it would also facilitate increased pedestrian access.

2.4.5 Interconnectivity to Underutilized Land and Historic Buildings

Despite considerable development and investment over the past decade, some commercial spaces and historic buildings remain that could be brought to higher and better use in the study area, particularly along Broadway and in South Park. These areas, because of their separation distance, are geographically isolated from the primary employment centers of Bunker Hill and the Financial District and have reduced local transit circulation opportunities and fewer connections to Metro Rail. Approximately one million square feet of potential commercial and residential space is currently unused in historic buildings, primarily on and around Broadway (Los Angeles Times 2015). It would be beneficial to strengthen the connection between Broadway, South Park, and the major activity centers in downtown.

2.4.6 Restoration of Streetcar Service

Restoring the streetcar service would provide a strong connection between Los Angeles’ past, which was built around the streetcar, and its goals for a more transit-oriented future, through the following:

- Restore streetcar service which was historically important to the development of the Los Angeles County region;
- Establish a visible focal point for local transit service which is easily identifiable and distinctive; and
- Convey a sense of permanency through the implementation of fixed-guideway transit.
This chapter describes the Build Alternative, including cost and ridership and summarizes the Alternatives Analysis and CEQA process that resulted in the selection of the LPA.

### 3.1 Alternatives

#### 3.1.1 No Build Alternative

Under the No Build Alternative, the proposed streetcar service would not be implemented in downtown. Specifically, the streetcar would not be constructed, nor would the TPSS, OCS, or MSF. Existing transit service and traffic operations would remain unchanged and continue to function as they do today. Consequently, the No Build Alternative would not achieve the Project objectives of enhancing mobility and transit circulation or supporting growth and revitalization in Downtown because no new transit improvements would occur under this alternative.

#### 3.1.2 7th Street Alignment Alternative

The 7th Street Alignment Alternative (Project) would construct and implement streetcar service along an alignment that would begin at the corner of Hill and 1st Streets. From 1st Street, the streetcar would turn south on Broadway, traveling to 11th Street where it would turn west and continue on to Figueroa Street. The streetcar would then turn north on Figueroa Street and travel to 7th Street, where it would turn east. From 7th Street, the streetcar would turn north on Hill Street, then continue back to 1st Street, completing the circuit. The majority of the streetcar alignment would be side-running tracks as shown in the example cross section, although portions of the alignment on 11th, 7th, and Hill Streets would be center-running.

The Project includes a Grand Avenue Extension Design Option that would construct and implement streetcar service along an alignment that would begin on Grand Avenue north of 2nd Street adjacent to the Disney Concert Hall, then continue northward until turning east on 1st Street. The terminal point would be Grand Avenue north of 2nd Street rather than Hill and 1st Streets. The streetcar alignment for the Grand Avenue Extension would include center-running tracks on Grand Avenue and First Street.

The regional location is shown in Figure 3.1-1 and the alignment is shown in Figure 3.1-2.
Figure 3.1-1. Regional Location Map
Figure 3.1-2. Proposed Downtown Los Angeles Streetcar Route
3.1.2.1 Elements of Streetcar Alternatives

This section describes the elements of the proposed streetcar system that are common to the build alternatives of the Project. A summary of the vehicle type, platform layout, support facilities such as the OCS, the TPSS, MSF, signaling, and proposed intersection improvements are described below.

3.1.2.1.1 Vehicles

The Project’s operating plan calls for 7-minute headways (i.e., time intervals between vehicles) during peak periods. A fleet of six electrically powered streetcars is currently estimated to be needed to operate at that frequency. An estimated two additional streetcars would serve as backup vehicles to the operating fleet, for a total estimated fleet size of eight vehicles. Each vehicle would measure approximately 65 to 85 feet long and be approximately 13 feet high. The streetcars would be articulated to make tight turns and have a capacity of approximately 100 passengers. The streetcars would be similar to the modern streetcar models that are currently used in other cities in the United States. The streetcars would be designed with low floors to be ADA compliant. Operating speeds would be at the maximum posted downtown speed limit, which is currently 25 mph on all streets other than Figueroa Street, between 5th Street and Pico Boulevard, where it is 30 mph. Power for the streetcars would be transmitted by OCS contact wires supported by poles along the streetcar tracks (see Section 3.1.2.1.3).

Based on the current schedule, the vehicle Request for Proposals will be released in 2018 and notice-to-proceed issued to the vehicle manufacturer in 2019. Vehicles would arrive starting in 2021 with the final vehicle arriving in 2022.

3.1.2.1.2 Platforms

The current plans include up to 24 platforms. The streetcars would make stops at 23 stations along the alignment, and the potential Grand Avenue Extension includes one additional station. The number of platforms is subject to change based upon further design of the Project. With varying configurations, the platforms would generally consist of a raised concrete pad approximately 8 feet wide by 70 feet long. Some of the streetcar platforms would be shared by Metro, other regional operators, and LADOT DASH buses. Shared platforms would generally be approximately 120 feet long, though physical constraints on some street segments could limit them to approximately 70 feet long. The maximum curb height would be approximately 8 to 14 inches. Platforms would be located adjacent to the sidewalk under the Project, although the Grand Avenue Extension would include a platform in the center of Grand Avenue.
Proposed locations are shown in Figures 3.1-3a through 3.1-3j. Platforms on the west side of Broadway for the south running streetcar include:

- Between 2nd and 3rd Streets
- Between 3rd and 4th Streets
- Between 4th and 5th Streets
- Between 5th and 6th Streets
- Between 6th and 7th Streets
- Between 7th and 8th Streets
- Between 8th and 9th Streets
- Between 9th and 10th Streets
- Between 10th and 11th Streets

Platforms on the south side of 11th Street for the west running streetcar include:

- Between Hill and Olive Streets
- Between Grand Avenue and Hope Street

Platforms on the east side of Figueroa Street for the north running streetcar include:

- Between 11th Street and Olympic Boulevard
- Between Olympic Boulevard and 9th Street
- Between 9th Street and 8th Place
- Between 8th Place and 8th Street

Platforms on the south side of 7th Street for the east running streetcar include:

- Between Figueroa and Flower Streets
- Between Hope Street and Grand Avenue
- Between Grand Avenue and Olive Street

Platforms on the east side of Hill Street for the north running streetcar include:

- Between 7th and 6th Streets
- Between 6th and 5th Streets
- Between 5th and 4th Streets
- Between 4th and 3rd Streets
- Between 3rd and 2nd Streets

The Grand Avenue Extension would include an additional platform on Grand Avenue between 1st and 2nd Streets.

Platforms would transition from the sidewalk to match or nearly match the floor height of the streetcar vehicles. Platforms would be designed and constructed to connect to the sidewalk in a way that meets ADA and building access requirements.

The platforms would resemble typical bus stops, would have distinctive signage, and may include amenities such as shelters, benches, Light Emitting Diode (LED) signs displaying minutes to expected streetcar arrival, and kiosks containing information on the route, schedule, and fares. The design and location of the platforms would be developed so as to be consistent with related projects that may construct streetscape elements such as curb extensions, bus stops, or other street amenities along the Project alignment. Platform locations would be chosen to avoid conflicts with existing driveways; therefore, they could be located mid-block or on the far side of intersections, as required.
Figure 3.1-3a. Proposed Platform Locations

LEGEND

Proposed Stations

Proposed Route

Platform locations and the proposed route are based on 30% design and may slightly change during final design. The section shown is part of the Grand Avenue Extension, which is an optional addition to the Project, if additional funding can be identified.
Figure 3.1-3b. Proposed Platform Locations

LEGEND

- Purple Proposed Stations  Yellow Proposed Route

Platform locations and the proposed route are based on 30% design and may slightly change during final design.
City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-3c. Proposed Platform Locations

LEGEND

- Proposed Stations
- Proposed Route

Platform locations and the proposed route are based on 30% design and may slightly change during final design. City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-3d. Proposed Platform Locations

Legend:
- **Proposed Stations**
- **Proposed Route**

Platform locations and the proposed route are based on 30% design and may slightly change during final design.

City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-3e. Proposed Platform Locations

LEGEND

- Proposed Stations
- Proposed Route

Platform locations and the proposed route are based on 30% design and may slightly change during final design.

City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-3f. Proposed Platform Locations

LEGEND

- Proposed Stations
- Proposed Route

Platform locations and the proposed route are based on 30% design and may slightly change during final design. City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-3g. Proposed Platform Locations

LEGEND

Proposed Stations  Proposed Route

Platform locations and the proposed route are based on 30% design and may slightly change during final design. City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-3h. Proposed Platform Locations

LEGEND

-紫色
  Proposed Stations
-虚线
  Proposed Route

Platform locations and the proposed route are based on 30% design and may slightly change during final design. City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-i Proposed Platform Locations

LEGEND

- **Proposed Stations**
- **Proposed Route**

Platform locations and the proposed route are based on 30% design and may slightly change during final design. City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
Figure 3.1-3j. Proposed Platform Locations

**LEGEND**

- **Proposed Stations**
- **Proposed Route**

Platform locations and the proposed route are based on 30% design and may slightly change during final design. City of Los Angeles projects, including the Broadway Streetscapes Master Plan and 7th Street Improvements Project, will modify sidewalks in the future condition such that each of these platforms will be sidewalk-adjacent.
3.1.2.1.3 Support Facilities

3.1.2.1.3.1 Overhead Contact System

There are two potential configurations for the OCS contact wires, which would supply electrical power to the streetcar vehicles. One configuration would be to support the contact wire with a span wire between two poles located on either side of the street, perpendicular to the streetcar track. Another configuration would support the contact wire from cantilever arms connected to single poles. Configurations would be site-specific and be made based upon engineering design and aesthetic considerations. Both of these configurations could use decorative poles chosen to be consistent with the streetscape along the Project alignment. It is possible that poles used for delivering streetcar power could also be integrated with other streetscape infrastructure such as street lighting, traffic signals, or traffic signs. OCS suspension at corner turning locations (e.g., Hill/1st Streets, 1st Street/Broadway, Broadway/11th Street, 11th/Figueroa Streets, Figueroa/7th Streets, 7th/Hill Streets) would be more specialized and tailored to each location, possibly requiring a combination of wire-mounting configurations. OCS poles would be approximately 25 to 30 feet tall and would be typically installed at intervals of about 80 to 120 feet, with added poles at turns. Wire heights above the tracks would typically range between approximately 18 and 19 feet in the public right-of-way.

3.1.2.1.3.2 Traction Power Substations

The streetcars would be powered by an estimated five TPSS units spaced relatively evenly throughout the alignment to provide DC power for the streetcars; final number and placement will be determined by further project design. Each unit would be a durable structure containing electrical and electronic equipment. Based on typically-sized equipment used in other cities, the TPSS units would most likely measure approximately 17 feet long by 11 feet wide by 11 feet high, although these dimensions could vary. The footprint needed for the TPSS installations could be up to approximately 250 square feet. The substations, typically rated at 350 kilowatts, would convert 480-volt commercial Alternating Current (AC) power to 750-volt DC power for the streetcars.
Each TPSS unit would typically be placed in an off-street location, such as a parking lot or other suitable site. At one location, 2nd Street and Grand Avenue, the currently recommended potential TPSS site may need to occupy space in the public right-of-way. A number of potential TPSS locations and alternate sites are being evaluated in the event that primary sites are found to be infeasible.

Recommended TPSS locations are shown in Table 3.1.1 and Figure 3.1-2. The locations have been identified based upon the following criteria.

- Available publicly owned property.
- Proximity to equal (0.95 mile) spacing increments.
- Maintenance access—easy access from street, with identified entrance/exit access points.
- Lot size.
- Proximity to mainline.
- Maintaining site driveways and access points.
- Potential TPSS locations are shown in Figure 3.1-4 at currently estimated locations.

**Table 3.1-1. Traction Power Substation (TPSS) Sites**

<table>
<thead>
<tr>
<th>TPSS</th>
<th>Priority for Location</th>
<th>Address</th>
<th>APN</th>
<th>Parcel Square Footage</th>
<th>Existing Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Recommended</td>
<td>Within Public ROW</td>
<td>--</td>
<td>--</td>
<td>Transportation right-of-way</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>131 S. Olive St.</td>
<td>5149-010-949</td>
<td>192,480</td>
<td>Parking structure</td>
</tr>
<tr>
<td>2</td>
<td>Recommended</td>
<td>208 S. Broadway</td>
<td>5149-008-030</td>
<td>8,540</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>229 S. Broadway</td>
<td>5149-009-014</td>
<td>18,960</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>Alternative/Temporary</td>
<td>213 S. Spring St.</td>
<td>5149-008-029</td>
<td>471,443</td>
<td>Parking structure</td>
</tr>
<tr>
<td>3</td>
<td>Recommended</td>
<td>826 S. Broadway</td>
<td>5144-016-062</td>
<td>8,179</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>913 S. Broadway</td>
<td>5139-003-003</td>
<td>7,661</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>951 S. Broadway</td>
<td>5139-003-009</td>
<td>4,766.10</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td>4</td>
<td>Recommended</td>
<td>833 S. Flower St.</td>
<td>5144-021-041</td>
<td>180,458</td>
<td>Parking structure</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>928 S. Figueroa St.</td>
<td>5138-002-029</td>
<td>8,325</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td>5</td>
<td>Recommended</td>
<td>431 S. Hill St.</td>
<td>5149-027-013</td>
<td>32,460</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>628 S. Hill St.</td>
<td>5144-003-024</td>
<td>1,225</td>
<td>Jewelry store</td>
</tr>
</tbody>
</table>

Source: City of Los Angeles Department of Transportation 2017.
Figure 3.1-4. Potential Maintenance and Storage Facility Locations Currently Under Consideration
3.1.2.1.3.3 Maintenance and Storage Facility

The Project would require an MSF to provide a location for secure storage of streetcar vehicles when they are not in operation, and regular light maintenance of the vehicles to keep them clean and in good operating condition. Two sites are being assessed for the MSF: (1) the southeast corner of 11th and Olive Streets; or (2) the west side of Broadway between 2nd and 3rd Streets (see Table 3.1-2 and Figure 3.1-4). Refer to Appendix A for the Maintenance and Storage Facility Site Selection Methodology Memorandum. The MSF would consist of an enclosed building and an outdoor area where routine inspections, maintenance work, and light repairs could be performed. The MSF would have sufficient storage capacity to handle the needs of the streetcar system, with paved maintenance aisles, a pit track, overhead crane, paved truck access, staff offices, parts storage areas, and a machine shop. An employee parking area may also be provided.

Table 3.1-2. Potential Maintenance and Storage Facility Properties Currently Under Consideration

<table>
<thead>
<tr>
<th>Potential MSF Locations</th>
<th>Address</th>
<th>APNs</th>
<th>Parcel Square Footage</th>
<th>Existing Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway and 2nd Street</td>
<td>233 S. Broadway</td>
<td>5149-009-018</td>
<td>18,960</td>
<td>Unoccupied single-story commercial building (former Goodwill)</td>
</tr>
<tr>
<td></td>
<td>229 S. Broadway</td>
<td>5149-009-014</td>
<td>18,960</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>236 S. Hill St.</td>
<td>5149-009-011</td>
<td>14,168</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>240 S. Hill St.</td>
<td>5149-009-025</td>
<td>5,631</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>237 S. Broadway</td>
<td>5149-009-004</td>
<td>9,990</td>
<td>Wedding chapel</td>
</tr>
<tr>
<td>11th Street and Olive Street (East)</td>
<td>1124 S. Olive St.</td>
<td>5139-019-011</td>
<td>10,138</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>218 W. 11th St.</td>
<td>5139-019-015</td>
<td>4,759</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td></td>
<td>1100 S. Olive St.</td>
<td>5139-019-040</td>
<td>31,500</td>
<td>Surface parking lot</td>
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<tr>
<td></td>
<td>Alley</td>
<td></td>
<td>4,800</td>
<td>Alley</td>
</tr>
</tbody>
</table>


A maintenance building for a system of the size of the Project would generally be 12,000 to 18,000 square feet, approximately two to three stories tall, contain tracks inside a garage enclosure for maintenance of the vehicles, and be constructed to comply with the City’s Green Building Code and also meet minimum LEED certification requirements. Acquisition of private property for a MSF would probably not require the entire parcel; however, until such time as a site design and configuration has been completed, the project evaluation assumes full acquisition would be needed. Streetcars would gain access to the facility from a short segment of track that would be connected to the mainline. A storage area outside of the maintenance facility would provide an area for overnight cleaning (i.e., wash facility with clarifier) and secure storage of streetcar vehicles. The photograph below shows an example of a typical MSF site.
3.1.2.1.3.4 Signaling

Streetcar movement would be governed by “line-of-sight” operations, with passage through intersections controlled by traffic signals. Line-of-sight operations means that streetcars would be controlled by an operator who would proceed when traffic signals and traffic allow, and who would stop for traffic signals, station stops, pedestrians, bicycles, and other vehicles. A separate signal head may be provided at intersections for streetcar control. The streetcar control signal would be interconnected with the traffic signals and would clearly indicate to the streetcar operator when it is clear for the streetcar to move or required to stop.

Transit signals (i.e., special signals separated from the general-purpose signal system) would be necessary when the streetcar requires a special traffic signal phase to maneuver so as to avoid conflicting with general traffic. These signals are also required at locations where a track switch is used by the streetcar operator to choose between different paths. Most of the route for the Project would not have transit signals. Operation of transit signals would be separated from the normal traffic signals in order to not be confusing to the general public.

Where necessary, TWC would be used to limit conflicting traffic at turning locations and provide streetcars a dedicated signal phase to move safely across an intersection.

3.1.2.1.3.5 Potential Layover Locations

Locations on the streetcar route are needed to provide space for a streetcar to layover out of traffic, to allow dispatch according to a regular schedule, or to provide space for a streetcar to be temporarily taken out of service. In addition, these locations would allow the streetcar operator to take a short break. For the route currently proposed, two such locations would be desirable.

Four locations have currently been identified as potential layover sites. At these locations, a short section of parallel track would need to be provided to allow space for the streetcar to move off the main line while the layover is taking place. These sites include (a) Broadway, near-side at 2nd Street; (b) Broadway, far-side at 2nd Street; (c) Broadway, mid-block between 2nd and 3rd Streets; and (d) 11th Street, near-side at Hill Street.

Under the Grand Avenue Extension Design Option, at the stop on Grand Avenue at 2nd Street, a single track in an exclusive median is currently proposed. This configuration would allow the streetcars to complete their round trip and layover out of traffic for several minutes until the next scheduled departure. The streetcar vehicles will have operator cabs on both ends of the cars so that they are able to operate in either direction of travel.
All of the above currently considered layover locations are being evaluated as part of further design advancement of the Project, and are therefore subject to change with regard to location and/or track layout.

3.1.2.2 Project Design Elements

3.1.2.2.1 Intersection Improvements

Several improvements to the downtown street system are included in the Project design. In order to properly integrate streetcar service into the flow of traffic within downtown, maintain adequate operating conditions for all modes, and provide conditions to achieve optimum streetcar travel times. The following traffic signal improvements are included as part of the Project:

- Protected eastbound left-turn phase at the intersection of Hill Street and 7th Street.
- It is assumed that existing right-turn lanes from southbound Broadway to 3rd, 5th, 8th, and 11th Streets are to be permanently maintained.
- It is assumed that a “Pedestrian Scramble” phase would be added to 7th Street and Figueroa Street as part of a 7th Street streetscape improvement project. It is also assumed that a right-turn lane would be provided on eastbound 7th Street from the Streetcar Platform to Flower Street.
- Protected northbound right-turn phase at the intersection of Grand Avenue and 1st Street (Grand Avenue Extension Design Option Only).
- Mid-block pedestrian crosswalk traffic signal on Hill Street between 1st Street and 2nd Street to allow streetcar to move from right lane to left-turn lane (Grand Avenue Extension Design Option Only).
- Protected northbound left-turn phase at the intersection of Hill Street and 1st Street (Grand Avenue Extension Design Option Only).
- Mid-block signal with pedestrian crosswalk added to Grand Avenue between 1st and 2nd Streets for access to median platform (Grand Avenue Extension Design Option Only).

Green signal time allocated to streetcar movement would be redistributed, within the existing signal cycle length, at the following currently anticipated locations; the amount of time would vary according to operating conditions at each intersection:

- Grand Avenue/1st Street
- 1st Street/Hill Street
- Broadway/2nd Street
- Broadway/8th Street
- Broadway/Olympic Boulevard
- 11th Street/Hill Street
- 11th Street/Hope Street
- Figueroa Street/9th Street
- Figueroa Street/8th Street
- Hill Street/5th Street
- Hill Street/6th Street
Protected right-turn arrows would be provided to clear right-turn queues before or after the crossing of pedestrians, at the following locations:

- Broadway/3rd Street
- Broadway/8th Street
- Figueroa Street/7th Street

Right-turn only pocket lanes would be added or maintained at the following locations:

- Broadway/3rd Street – a right-turn only lane from southbound Broadway at 3rd Street.
- Broadway/5th Street – a right-turn only lane from southbound Broadway at 5th Street.
- Broadway/8th Street – a right-turn only lane from southbound Broadway at 8th Street.
- Broadway/11th Street – a right-turn only lane from southbound Broadway at 11th Street.
- Hill Street/6th Street – a right-turn only lane from northbound Hill Street at 6th Street.

The eastbound right-turn storage lane is currently expected to be extended on eastbound 7th Street to southbound Flower Street to minimize queue spillover. Figure 3.2-1 depicts intersection improvements within the downtown Los Angeles Streetcar route. It should be noted that further development of the Project’s design and operating characteristics may result in a change to one or more of the above currently estimated improvements.

### 3.1.2.2 Proposed Lane Reconfiguration

In order to accommodate the streetcar, Hill Street would need to be reconfigured; however, the proposed changes would not reduce the existing number of travel lanes along Hill Street. On-street parking and/or center turn lanes along certain segments would be removed. Reconfiguration would include bump outs at some street corners to accommodate station platforms, which would create and allow for full-time on-street parking/loading spaces along the east side of Hill Street.

### 3.1.2.3 Streetcar Safety Elements

The Project would be designed to maximize pedestrian safety and accessibility through the implementation of measures that would minimize or avoid vehicular/pedestrian and vehicular/bicycle conflicts. Design elements of the streetcar system may include, but would not be limited to, the following: streetcars equipped with lighting and audible warning devices, TWC, signage, striping, and wayfinding. Operators would also develop transit safety programs, with the goal of raising streetcar safety awareness in the community.

### 3.1.2.4 Bus Service Coordination and Traffic Rerouting Notifications

The City would coordinate with bus operators, including, but not limited to, Metro, DASH, Montebello Bus Lines, and Gardena Municipal Bus Lines, prior to implementation of designs that could result in necessary rerouting of buses.

Before any major rerouting changes are made as a result of the Project, fliers would be provided on buses at least two weeks in advance notifying riders of route modifications. In addition, hoods would be placed over bus-stop signs, also notifying riders of what modifications have been made to the bus route.
Figure 3.2-1. Intersection Improvements
3.1.2.3 Construction Activities

3.1.2.3.1 Introduction

Construction activities for the Project would be managed from a contractor’s office that would be maintained throughout the construction process. The contractor’s office may use portable trailers or vacant office space in an existing building. Parking for approximately 20 to 30 vehicles would be needed for construction management personnel and visiting agency or owner representatives and visitors. The location of the contractor’s office will be chosen prior to the start of construction.

Construction activities associated with the Project would affect portions of Grand Avenue, 1st Street, Broadway, 11th Street, Figueroa Street, 7th Street, and Hill Street, as well as the selected MSF and TPSS sites. Construction activities would include pavement removal, utility relocation, excavation, construction of track drains, installation of concrete track slab and rails, construction of station platforms, installation of special track work units, reconstruction of ramps and sidewalks, paving, and striping. Other activities would include installation of specialty system work, such as traction power, overhead contact wire, communications systems, train/traffic signaling, and OCS pole foundations. The remainder of this section offers a typical description of how the construction process would proceed. It should be noted that the actual construction process and schedule will be determined by the contractor at the time of construction; therefore, the information presented below should be regarded as illustrative of similar typical construction processes. Refer to Appendix B for the Construction Methods Technical Memorandum.

Construction equipment that may be required for the Project would typically include backhoes, small cranes, dump trucks, concrete trucks, paving equipment, rail transporters, bulldozers, graders, cranes, compactors, rollers, drill rigs, paving machines, rail welding equipment, concrete mixers, flatbed trucks, dump trucks to haul dirt, rail installation vehicles, and various hand and power tools. Additional information regarding the construction equipment assumptions is provided in Sections 4.2, Air Quality and 4.8, Greenhouse Gas Emissions.

It is estimated that the maximum number of construction workers expected at any one time could be approximately 70 to 75, including utility workers; demolition workers; track workers; paving, sidewalk, and curb workers; construction management; inspectors; and MSF workers.

Laydown and storage area(s) for construction would be established near the Project alignment and would be used for storage of equipment and materials. The laydown and storage area(s) could be located within the right-of-way, in parking lots, or on vacant land, and would be used to store equipment and materials. Four potential laydown and storage areas have been currently identified for evaluation: (1) the southeast corner of 3rd Street and Main Street; (2) northeast corner of 3rd Street and Spring Street; (3) 243 South Spring Street; and (4) Grand Avenue to Olive Street, between 8th Street and 9th Street. However, these should be regarded as example sites, and other locations within the study area may become available and be chosen. All four example locations are currently being used as parking lots adjoining City streets within one block of the Project alignment.

Material removed to make room for the Project and brought in to be installed as part of the Project will use haul routes designated by the LADOT. Potential routes from the north end of the Project could be north along Broadway to enter U.S. 101 or east along 1st Street and then north along Los Angeles Street to enter U.S. 101. From the south end of the Project, a potential route could be west along 11th Street and then south along Los Angeles Street to enter Interstate 10. It should be noted
that these routes are illustrative examples; designated routes will be determined by LADOT in consultation with the project contractor.

Project construction activities would typically take place on weekdays between 7:00 a.m. and 9:00 p.m., in accordance with LAMC Section 41.40(a). To expedite construction, certain construction activities may occur during nighttime, weekend, and holiday periods with the approval of the Board of Police Commissioners pursuant to LAMC Section 41.40(j). In addition, construction within City roadways may occur during peak periods (i.e., 6:00 a.m. to 9:00 a.m. and 3:30 p.m. to 7:00 p.m.) in accordance with Mayor’s Executive Directive No. 2 and LABOE Special Order No. 001-0406, which provide an exemption to the rush hour roadway construction prohibition for major public works projects having traffic mitigation plans.

Furthermore, construction activities will follow the City’s Department of City Planning new policy (in effect June 2015) to maintain safe adjacent pedestrian access at all times during construction.

The analysis in this document assumes that, unless otherwise stated, the Project would be designed, constructed, and operated following all applicable laws, regulations, ordinances, and formally adopted City standards, including but not limited to the LAMC; LADOT design standards and special provisions; California Manual on Uniform Traffic Control Devices; and all City bureaus’ design manuals, special provisions, and standard plans, including the latest Standard Specification for Public Works Construction (SSPWC or Green Book); the City of Los Angeles Department of Public Works (LADPW), BOE Brown Book; the Work Area Traffic Control Handbook; and any FTA requirements.

### 3.1.2.3.2 Utility Relocation

The approach required to handle utilities during construction would depend on the type, length, number, and complexity of the utility to be constructed, protected, or relocated. Utilities in potential conflict with streetcar construction would include, but are not limited to, storm drains, sanitary sewers, water pipelines, power lines, gas pipelines, electrical duct banks, lighting cables, fiber optic lines, telephone, cable lines, and underground conduits for traffic signals and roadway lighting. To the extent possible, the streetcar trackway and facilities would be located to avoid or minimize conflicts with existing utilities.

In addition to relocation of existing utilities, new utilities would be installed as part of the Project, including electrical duct banks, traffic signal conduits, and electrical service lines. Utility relocation is typically the first work item to be performed on a project. Once utility relocation has been completed within a segment, track work and civil construction will commence, and the utility relocation work crews would move on to the next segment. This method of sequencing typically would allow crews to keep utility relocation work proceeding ahead of the track work, and would keep construction activity confined to two segments at a given time.

### 3.1.2.3.3 Track Construction

All tracks and platforms would be located within the public right-of-way. The majority of the tracks would be located within existing traffic lanes, providing a mixed-flow traffic operation. A short segment of Grand Avenue (under the Grand Avenue Extension) would operate in an exclusive trackway south of 1st Street in order for the operator to stop the vehicle and switch directions safely.

The construction of a trackway within an existing City street would involve the use of embedded track (rails encased in a concrete track slab). Temporary street closures, affecting traffic lanes,
driveway access, and bicycle lanes, will be needed. Widely publicized advance notice will be provided to property owners, business owners, tenants, and the general public.

Track work construction would include demolition of the roadway sections being displaced by the track slab, preparation of the track bed, placement of reinforcing-steel (if used), and placement of rails in their exact alignment. Ground-disturbing activities would extend to a depth up to approximately 10 feet below the ground’s surface. Once the rail is positioned using adjustable gauge rods and wrapped with rail boot to minimize stray current leakage, concrete would be poured around the rail and rebar to form the concrete track slab.

It may be possible that precast concrete track panel sections would be used as a method to increase the rate of trackway production. These may be proposed across intersections and other access points that would benefit from a reduced duration of temporary closure.

Construction of station platform foundations, restoration of pavement, and reconstruction of any sidewalks and ramps would begin simultaneously or immediately following the track slab within each segment. Once the track is placed, the pavement is restored, and sidewalks and ramps are reconstructed, the closed roadway lanes could typically reopen to traffic.

3.1.2.3.4 Maintenance and Storage Facility

The vehicle MSF would typically be constructed early to midway during track construction to provide the ability to test and store the streetcar vehicles prior to operation. Constructing the MSF may involve a greater level of disruption than that associated with the tracks or stops because it requires excavation to an approximate depth of 10 feet below the ground’s surface; soil remediation, if necessary; street closures; construction staging areas; traffic control; and utility issues related to building a permanent structure. The MSF would be constructed from standard building materials that would be durable and resistant to vandalism.

3.1.2.3.5 Streetcar Stop Platforms

The first step of platform construction involves installing underground service utilities to a depth up to approximately 10 feet below ground’s surface, setting forms, and pouring concrete foundations and curbs. The platform surface, along with ramps and steps connecting to the platform, would be constructed next, followed by setting canopies and other platform amenities. Platforms would be constructed from standard building materials that are durable and resistant to vandalism.

3.1.2.3.6 Operating Systems Installation

This segment of construction would include installation of rail system elements, such as the OCS for streetcar power distribution (i.e., poles and wiring), TPSS, and communication systems.

Systems installation generally follows the completion of track construction. Finishing for platforms usually overlaps with systems work and is completed prior to final testing and pre-revenue operations. Systems installation work is less disruptive to communities than track construction work. Because the work area would be confined to the track area, a minimal number of partial lane closures are anticipated.
3.1.2.3.7 Testing and Start-Up

This stage includes testing of streetcar operations and communication systems, signal coordination, and personnel training prior to the opening of the streetcar system.

3.1.2.3.8 Streetcar Operations

The currently proposed operating plan assumes that the streetcar system would operate seven days a week with an estimated three to six streetcars running at any given time. The run time for a round trip would be on average approximately 35 to 40 minutes for any of the Build Alternatives. As shown in Table 3.1-3, at morning and evening peak hours, an estimated six vehicles would be in operation, with headways of approximately seven minutes at a given location. During non-peak mid-day hours, an estimated four vehicles would be in operation, with headways of approximately 10 minutes. During non-peak evening hours, an estimated three vehicles would be in operation, with headways of approximately 15 minutes. Hours of operation would be 6:00 a.m. to 12 midnight, Monday through Thursday; 6:00 a.m. to 2:30 a.m. on Friday; 9:00 a.m. to 2:30 a.m. on Saturday; and 9:00 a.m. to 12 midnight on Sunday and holidays. The maximum operating speed is assumed to be 30 mph or less on Figueroa Boulevard, and 25 mph or less everywhere else.

Table 3.1-3. Estimated Streetcar Operating Plan

<table>
<thead>
<tr>
<th>Number of Vehicles</th>
<th>Operating Hours</th>
<th>Headway (minutes)</th>
<th>Monday to Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday/Holidays</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>AM/PM Peak Hour</td>
<td>7</td>
<td>6 a.m.–9 a.m.</td>
<td>6 a.m.–9 a.m.</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 p.m.–6 p.m.</td>
<td>3 p.m.–6 p.m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Mid-Day Non-Peak</td>
<td>10</td>
<td>9 a.m.–3 p.m.</td>
<td>9 a.m.–3 p.m.</td>
<td>9 a.m.–5 p.m.</td>
<td>9 a.m.–5 p.m.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Evening Non-Peak</td>
<td>15</td>
<td>6 p.m.–12 midnight</td>
<td>6 p.m.–2:30 a.m.</td>
<td>5 p.m.–2:30 a.m.</td>
<td>5 p.m.–12 midnight</td>
</tr>
</tbody>
</table>

Source: HDR 2013.

3.1.2.4 Ridership

Ridership was forecast using the FTA tool for estimating transit ridership: STOPS Model (Version 2.0). The results are shown in Table 3.1-4.

Table 3.1-4. Daily Ridership Estimates

<table>
<thead>
<tr>
<th>Alternative</th>
<th>2020&lt;sup&gt;a&lt;/sup&gt;</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>4,181</td>
<td>5,370</td>
</tr>
<tr>
<td>Project with Grand Avenue Extension</td>
<td>5,860</td>
<td>7,760</td>
</tr>
</tbody>
</table>


<sup>a</sup>The ridership forecast was prepared assuming streetcar operations would begin in late 2020. It has been determined that operations would now begin 6 months later than previously assumed for the Project resulting in a 2021 opening date. Nevertheless, the ridership forecast considered both ridership and VMT reductions through the year 2040, and indicated that both ridership and VMT reductions would increase throughout that period. A six-month delay in the opening date does not substantially alter this analysis.
3.1.2.3 Project Cost

The following section presented capital and operating and maintenance (O&M) costs. The costs are presented for the Project without and with the Grand Avenue Extension Design Option.

3.1.2.3.1 Capital Cost

Capital cost estimates for the Project and Grand Avenue Extension Design Option are provided in Table 3.1-5. The estimates are based upon a 30 percent project design level and include the following components:

- Construction costs – Utility relocation, installation of trackwork, installation of streetcar stop platforms and ancillary equipment (e.g., canopies and other platform amenities), installation of operating systems (overhead contact system poles and wiring; traction power substations, communications systems), and testing and start-up;
- Vehicle procurement;
- Maintenance and Storage Facility – Property acquisition, facility construction, equipment and systems installation, etc.;
- Professional services – Design, project development and management, insurance, permits and authorizations, surveys, etc.; and
- Contingencies.

Table 3.1-5. Capital Costs (2017 $; expressed in millions)

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Project</th>
<th>Project with Grand Avenue Extension Design Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>$117.7</td>
<td>$9.9</td>
</tr>
<tr>
<td>Vehiclesa</td>
<td>$42.9</td>
<td>$0</td>
</tr>
<tr>
<td>Land Acquisitionb</td>
<td>$43.9</td>
<td>$0</td>
</tr>
<tr>
<td>Professional Services</td>
<td>$44.8</td>
<td>$3.7</td>
</tr>
<tr>
<td>Unallocated Contingenciesc</td>
<td>$24.9</td>
<td>$1.0</td>
</tr>
<tr>
<td>Finance Charges</td>
<td>$16.5</td>
<td>$1.0</td>
</tr>
<tr>
<td>Total</td>
<td>$290.7</td>
<td>$15.6</td>
</tr>
</tbody>
</table>

Source: City of Los Angeles 2017.

a Six vehicles for daily operations plus two additional spares.
b Applicable to either MSF site.
c Estimated at 10 percent.
d Incremental costs associated with the addition of the Grand Avenue Extension Design Option.

3.1.2.3.2 Operating and Maintenance Costs

O&M costs are important for assessing cost effectiveness and establishing appropriate financial planning. These cost estimates are provided in Table 3.1-6 for the Project and Grand Avenue Extension Design Option.
### Table 3.1-6. Operating and Maintenance

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Project</th>
<th>Project with Grand Avenue Extension Design Optiona</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Revenue Miles</td>
<td>134,361</td>
<td>152,144</td>
</tr>
<tr>
<td>Annual Revenue Hours</td>
<td>23,052</td>
<td>26,345</td>
</tr>
<tr>
<td>Peak Vehicles</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Annual O&amp;M Costs</td>
<td>$6.618 M</td>
<td>$6.639 M</td>
</tr>
<tr>
<td>Cost Per Revenue Mile</td>
<td>$49</td>
<td>$47</td>
</tr>
<tr>
<td>Cost Per Revenue Hour</td>
<td>$287.09</td>
<td>$252.00</td>
</tr>
</tbody>
</table>

Source: City of Los Angeles 2017.

a Costs shown reflect total O&M with inclusion of the Design Option.

### 3.2 Alternatives Development and Selection of the Locally Preferred Alternative

#### 3.2.1 Alternatives Analysis

A formal Alternatives Analysis process (Metro 2012) was conducted to develop and evaluate potential alternatives for restoring historic streetcar service in downtown Los Angeles. This process was carried out with the cooperation of CRA/LA, Metro, LASI, and FTA. The Alternatives Analysis was the culmination of several planning and feasibility studies that were conducted between 1995 and 2010; it was completed in 2012.

The Alternatives Analysis process developed a range of routing and operating options and evaluated them using a two-step screening process. The initial screening was a conceptual-level evaluation of the advantages and disadvantages of the alternatives considered. It included an analysis of alternatives that were developed cooperatively by Metro, CRA/LA, the "Bringing Back Broadway" initiative, and LASI. The purpose of the initial screening was to narrow down the range of alternatives considered for more detailed analysis in a subsequent final screening phase. The initial screening evaluation criteria were qualitative in nature and sought to eliminate alternatives having "fatal flaws" or that did not meet project goals or have public support.

The final screening evaluation criteria were more quantitative than those used in the initial screening and addressed additional topics such as ridership potential, operational characteristics, costs, system configuration, design issues, environmental issues, land use and economic development opportunities, and community support. Below is a summary of the alternatives that were considered in the Alternatives Analysis and the results of the initial and final screening evaluations.

#### 3.2.1.1 Initial Screening of Alternatives

The alternatives were initially screened according to evaluation criteria developed by CRA/LA and Metro. The evaluation criteria correlated to the Project’s first two objectives stated above, which were originally generated during public workshops, meetings, and open houses intended to reflect input from public agencies, community groups, and stakeholders.
To evaluate the range of alternatives and reduce the number of potential combinations of alternatives, the initial screening alternatives were divided into three geographic segments, within which a range of alternative alignments was analyzed. Use of Broadway in the southbound direction was common to each initial screening alternative. The following initial screening evaluation criteria were developed and a rating system of High (1), best score; Medium (2); or Low (3), least score, was used for each criterion:

- Length (shorter alternatives received higher ratings due to reduced capital costs).
- Connectivity among downtown's various districts.
- Missed destinations (alternatives not reaching major destinations received lower ratings).
- Required connections (alternatives that required transfers, walking, or stairs/escalators to reach major destinations received lower ratings).
- Street grade (alternatives that use streets with a grade above 9 percent received lower ratings).
- Out of direction travel (travel that increases time required).
- Ridership potential.
- Capital costs.
- O&M costs.
- Transit system integration (how well each alternative would connect to the existing transit system).
- Expandability (flexibility for future expansion of the streetcar service).
- Historic integrity (using streets that historically had streetcar service).
- Traffic delay.
- Travel and parking (alternatives requiring elimination of travel and/or parking lanes received lower ratings).
- Risks (major risks such as schedule, design, or construction).
- Economic development (ability of an alternative to serve areas with economic development potential).
- Local funding potential.
- Consistency with adopted plans and guidelines.
- Community support.
- Fatal flaws.

Table 3.2-1 provides the range of alternatives analyzed in the initial screening analysis and the individual scores resulting from the analysis.
Table 3.2-1. Initial Alternatives Screening by Segment

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Details</th>
<th>Overall Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEGMENT A – NORTH OF 5TH STREET</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| A1 | Northbound on Hill St. between 5th St. and 1st St., westbound on 1st St. between Hill St. and Hope St., two-way on Hope St. between 1st St. and Hope Place, and eastbound on 1st St. between Hope St. and Broadway. | • Uses Broadway/Hill St. couplet.  
• Uses 1st St. and Hope St. to access Bunker Hill.  
• Two-way segment on Hope St. between 1st St. and Hope St. could be single track.  
• Serves Bunker Hill.  
• Does not serve Union Station. | 34 |
| A2 | Northbound on Hill St. between 5th St. and 1st St., westbound on 1st St. between Hill St. and Grand Ave., southbound on Grand Ave. between 1st St. and 3rd St., westbound on 3rd St. between Grand Ave. and Hope St., northbound on Hope St. between 3rd St. and 1st St., and eastbound on 1st St. between Hope St. and Broadway. | • Uses Broadway/Hill St. couplet.  
• Uses 1st St. and a Grand Ave./3rd St./Hope St. clockwise loop to access Bunker Hill.  
• Serves Bunker Hill.  
• Does not serve Union Station. | 34 |
| A3 | Northbound on Olive St. between 5th St. and General Thad Kosciuszko (GTK) Way, westbound on GTK Way between Olive St. and Hope St., northbound on Hope St. between GTK Way and 1st St., and eastbound on 1st St. between Hope St. and Broadway. | • Uses Olive St. and GTK Way to access Bunker Hill.  
• GTK Way passes under Grand Ave. bridge deck.  
• Serves Bunker Hill.  
• Does not serve Union Station.  
• Forms a continuous loop. | 49 |
| A4 | Westbound on 5th St. between Hill St. or Olive St. to Grand Ave., northbound on Grand Ave. between 5th St. and 1st St., and eastbound on 1st St. between Grand Ave. and Broadway. | • Uses Grand Ave. (14% grade).  
• Requires custom vehicle technology and operation because of 14% grade on Grand Ave.  
• Risk regarding grade (feasibility cannot be determined until final design).  
• Creates one-way clockwise loop.  
• Serves Bunker Hill.  
• Does not serve Union Station.  
• Forms a continuous loop. | 32 |
| A5 | Northbound on Hill St. between 5th St. and Temple St., westbound on Temple St. between Hill St. and Grand Ave., two-way on Grand Ave. between Temple St. and 1st St., eastbound on Temple St. between Grand Ave. and Broadway, and southbound on Broadway between Temple St. and 1st St. | • Uses Broadway/Hill St. couplet.  
• Uses Temple St. and Grand Ave. to access Bunker Hill.  
• Two-way segment on Grand Ave. between Temple St. and 1st St. could be single track.  
• Serves Bunker Hill.  
• Does not serve Union Station. | 34 |
### Alternative Description Details

**Overall Score**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| A6 | Northbound on Hill St. between 5th St. and 1st St., westbound on 1st St. between Hill St. and Grand Ave., two-way on Grand Ave. between 1st St. and the Grand Ave. bridge deck north of 2nd St., and eastbound on 1st St. between Grand Ave. and Broadway. | - Uses Broadway/Hill St. couplet.  
- Uses 1st St. and Grand Ave. to access Bunker Hill.  
- Two-way segment on Grand Ave. could be single track, as could the track on 1st St.  
- Serves Bunker Hill.  
- Does not serve Union Station. | 25 |
| A7 | Eastbound on 1st St. between Hill St. and Main St., northbound on Main St. between 1st St. and Paseo de la Plaza, southbound on Los Angeles St. between Paseo de la Plaza and 1st St., and westbound on 1st St. between Los Angeles St. and Broadway. | - Uses Broadway/Hill St. couplet.  
- Uses Main St. /Los Angeles St. couplet to access Union Station.  
- Crosses US 101.  
- Serves Union Station.  
- Does not serve Bunker Hill.  
- Forms a continuous loop. | 28 |

**SEGMENT B – BETWEEN 5TH AND 9TH ST. S**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| B1 | Southbound on Broadway, northbound on Hill St. between 9th St. and 5th St. | - Uses Broadway/Hill St. couplet.  
- Uses peak-hour travel lane/off-peak parking lane on Hill St. (one or the other would need to be eliminated because they currently share the same travel lane). | 23 |
| B2 | Southbound on Broadway, northbound on Olive St. between 9th St. and 5th St. | - Uses Broadway/Olive St. couplet. | 25 |

**SEGMENT C – SOUTH OF 9TH ST.**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| C1 | Southbound on Broadway, westbound on Pico Blvd., northbound on Figueroa St., eastbound on 9th St. | - Can use Broadway/Hill St. or Broadway/Olive St. couplet.  
- Crosses Blue Line at grade at Pico Blvd. | 30 |
| C2 | Southbound on Broadway, westbound on Pico Blvd., northbound on Hope St., westbound on 11th St., northbound on Figueroa St., eastbound on 9th St. | - Can use Broadway/Hill St. or Broadway/Olive St. couplet.  
- Does not cross Blue Line at grade. | 32 |
| C3 | Southbound on Broadway, westbound on 11th St., northbound on Figueroa St., eastbound on 9th St. | - Can use Broadway/Hill St. or Broadway/Olive St. couplet.  
- Does not cross Blue Line at grade. | 27 |

Source: Metro 2012.  
*Lower scores denote better alternative performance.*

The initial screening evaluation yielded the following recommendations: (1) within Segment A, Alternatives A4, A6, and A7 should be advanced; (2) both Segment B alternatives should be advanced; and (3) within Segment C, Alternatives C1 and C3 should be advanced, with Alternative C2 being reserved as a variation of Alternative C1.
3.2.1.2 Final Screening of Alternatives

Prior to moving forward with the final screening, the alternatives were refined, added, or replaced, as follows:

- Alternative A4 was modified to accommodate the 14 percent grade on Grand Avenue by including an elevated bridge structure, starting north of 6th Street and crossing over 5th Street. To accommodate this change, a new Alternative B3 was added to connect Alternative A4 with Segments B and C.

- Alternative C1 was ultimately replaced by C2 to avoid the at-grade Metro Blue Line/Expo Line crossing on Pico Boulevard.

- Alternative B4 was added, which would use Figueroa Street between 7th Street and 9th Street and Hill Street between 5th Street and 7th Street. This addition was made in response to public and stakeholder requests for the Project to include an alternative that better served the Financial Core and the 7th Street/Metro Center station.

With the changes noted above, the segments were then combined into seven individual alternatives, which were evaluated in the final screening analysis.

Alternative 1 would begin at 1st Street and Grand Avenue, run east on 1st Street, south on Broadway, west on Pico Boulevard, north on Hope Street, west on 11th Street, north on Figueroa Street, east on 9th Street and north on Grand Avenue.

Alternative 2 would have the same route as Alternative 1, except that it would run west on 11th Street, from Broadway to Figueroa Street.

Alternative 3 would have the same route as Alternative 1, except that it would continue east on 9th Street until Hill Street and then north on Hill Street to 1st Street.

Alternative 4 would have the same route as Alternative 3, with two exceptions: (a) it would run west on 11th Street, between Broadway and Figueroa Street, and (b) it would include a two-way portion from 1st and Hill Streets to Grand Avenue, then south on Grand Avenue until 2nd Street.

Alternative 5 would have the same route as Alternative 1, but would add a loop Easton 1st Street to Los Angeles Street, then north past U.S. 101 to Cesar Chavez Avenue, west to Main Street, then south back to 1st Street.

Alternative 6 would have the same route as Alternative 4, including the added 1st Street loop as on Alternative 5, but without the Grand Avenue extension.

Alternative 7, which is the Locally Preferred Alternative, had the same route as the currently proposed preferred alternative, inclusive of the Grand Avenue extension.

3.2.1.3 Results of Final Screening

Table 3.2-2 presents the results of the final screening analysis. The lower numbers represent better performance under the criteria.
### Table 3.2-2. Final Alternatives Screening

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Alternative</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Ridership Potential</td>
<td>1 3 1 3 2 1 1</td>
<td>Alternatives 1, 3, 6, and 7 had the highest combined averages for daily boardings and boardings per mile.</td>
</tr>
<tr>
<td>Capital Costs</td>
<td>2 2 2 1 3 3 1</td>
<td>Alternatives 4 and 7 had the lowest capital cost.</td>
</tr>
<tr>
<td>Operation and Maintenance Cost</td>
<td>1 1 2 1 3 3 1</td>
<td>Alternatives 1, 2, 4, and 7 had the lowest operation and maintenance cost.</td>
</tr>
<tr>
<td>Cost/Benefit Ratio</td>
<td>1 3 1 1 1 3 1</td>
<td>Alternatives 1 and 3 had the lowest cost per user, followed by Alternative 7, Alternative 5, and Alternative 4.</td>
</tr>
<tr>
<td>Missed Destinations</td>
<td>3 3 2 1 3 3 1</td>
<td>Alternatives 1, 2, 3, 4, and 7 served Bunker Hill, while Alternatives 5 and 6 served Union Station.</td>
</tr>
<tr>
<td>Circulation</td>
<td>3 3 2 1 3 3 1</td>
<td>Alternatives 1 and 2 cannot serve stops on Grand Ave between 3rd St. and 6th St. because of an elevated bridge structure. Alternatives 5 and 6 cross U.S. 101 on-ramps/off-ramps.</td>
</tr>
<tr>
<td>Design Considerations</td>
<td>3 3 2 1 3 3 1</td>
<td>Alternatives 1 and 2 require an elevated bridge structure on Grand Ave. Alternatives 1 and 2 require modification of the Grand Ave. bridge deck. Alternatives 5 and 6 require modification of the Main St. and Los Angeles St. bridge decks over U.S. 101.</td>
</tr>
<tr>
<td>Environmental Issues</td>
<td>3 3 2 2 2 2 2</td>
<td>Alternatives 1 and 2 had the most potential environmental issues because of the elevated bridge structure on Grand Ave.</td>
</tr>
<tr>
<td>Economic Development</td>
<td>1 2 1 2 1 2 2</td>
<td>Alternatives 1, 3, and 5 (Pico Blvd.) had more economic development potential than Alternatives 2, 4, 6, and 7 (11th St.).</td>
</tr>
<tr>
<td>Total</td>
<td>16 21 14 13 19 21 11</td>
<td>The lower the score, the higher the performance of the alternative.</td>
</tr>
</tbody>
</table>

As demonstrated in Table 3.2-2, Alternative 7 (now known as 7th Street Alignment Alternative with Grand Avenue Extension Design Option) was the highest performing alternative. In general, Alternatives 3 through 6 and Alternative 7 (7th Street Alignment Alternative with Grand Avenue Extension Design Option) all were determined to have similar potential for environmental impacts, but less than that of Alternatives 1 and 2. To the extent that the screening criteria represent the project objectives, Alternatives 3, 4, and the 7 performed best among the final cut screening alternatives, with Alternative 7 performing best in the areas related to the project objectives. This alternative best achieved transit coverage and circulation and best fostered connections among major districts, destinations, and activity centers. While each of the alternatives assessed in the Alternatives Analysis would satisfy a majority of the project objectives, Alternative 7 (7th Street
Alignment Alternative with Grand Avenue Extension Design Option) was advanced because it best satisfied the project objectives while maintaining relatively low potential for environmental impacts.

### 3.2.1.4 Additional Variations Subsequent to the Alternatives Analysis

Subsequent to completion of the Alternatives Analysis, two additional variations were identified for evaluation. The first of these was an alternative alignment that would travel along 9th Street instead of 7th Street, between Figueroa Street and Hill Street. This variation was made necessary because LADOT, as part of the 2010 Bicycle Plan (DCP 2011), has implemented vehicle lane reductions on 7th Street in order to provide space for bicycle lanes. Recognizing that there could be potential traffic impacts on 7th Street that were previously unanticipated, the 9th Street Alternative was also included for further analysis.

The Grand Avenue Extension Design Option was the subject of some discussion related to heightened sensitivity regarding potential impacts on the acoustics of the Disney Concert Hall and the Dorothy Chandler Pavilion. Also, given the significant presence of these attractions, this portion of Bunker Hill does not exhibit the need for revitalization that exists in other areas within downtown. It has also been stated that the Regional Connector (currently under construction) would provide mobility and transit connectivity for Bunker Hill that would otherwise be lacking in other parts of the streetcar route. Finally, there are substantial pedestrian-oriented amenities in this area that are interconnected with wide sidewalks and public space, such that there is less need to improve pedestrian-oriented amenities compared to other portions of the study area. However, the Grand Avenue Extension Design Option would connect popular tourist attractions, entertainment venues, and government services along Grand Avenue to other parts of downtown Los Angeles. This would further increase Project ridership, reduce VMT, and improve mobility and accessibility in downtown Los Angeles. For these reasons, the two primary alternatives that were carried forward for evaluation in the Draft EIR (7th Street Alignment Alternative and 9th Street Alternative) were each considered both with and without the Grand Avenue Extension Design Option, thereby permitting a full range of choices that responded to both the project objectives and previously expressed concerns.

### 3.2.2 Rubber-Tired Transportation Systems Management Alternative

A rubber-tired transportation systems management (TSM) Alternative (i.e., local circulator bus) would provide general transit service improvements to enhance the capacity and efficiency of the existing transportation system. Improvements such as bus upgrades, traffic signal improvements, lane reconfiguration, and lane assignment changes, among other strategies, could be incorporated. A rubber-tired TSM Alternative could be similar to the Project with respect to alignment and level of service but would utilize rubber-tired vehicles (similar to existing buses) with no track.

Such a TSM Alternative was considered early in project development, but was not carried forward, for several reasons. First, and perhaps most important, a rubber-tired alternative would not meet one of the key elements of the Project’s purpose and need (see Chapter 2.0, Purpose and Need), namely assisting in the effort to revitalize downtown’s historic buildings. Restoring streetcar service would be consistent with the character of the historic portions of downtown that once had such complementary transit service as part of the urban landscape. The sense of permanency that would be provided by a fixed-rail transportation mode would be a substantial commitment to the
continued focus on downtown's historic core. A rubber-tired local circulator would not provide the same level of commitment.

Also, rubber-tired transit modes, despite their long-standing presence in downtown Los Angeles, have not been shown to have a substantial effect on economic development, and providing another bus route in downtown Los Angeles would not be expected to serve as a catalyst for revitalization. Fixed-guideway systems, on the other hand, have been demonstrated to lead to economic development because they provide a stronger sense of permanency and they also can be a transportation focal point that attracts visitors, tourists, and residents, which is also a stated objective of the Project.

Existing rubber-tired transit options in downtown Los Angeles have become ubiquitous and while they offer many options for users, their multiplicity of operators and routes can also be confusing to those who are not familiar with the range of choices and how to effectively navigate them. This perception and resultant hesitancy can be overcome by a permanent fixed route with separate branding that can be easier for the new or occasional user to understand.

Also, the streetcar features level boarding and exceptional ride quality, which would expand the range of riders attracted to the streetcar. Persons with mobility impairments could move on and off the vehicle without assistance, whereas with a rubber-tired vehicle, they would require a lift, a "kneeling" bus, or a ramp, which are sometimes inconvenient and can result in delays.

A rubber-tired transit alternative would not offer material benefits regarding environmental impacts. It would not shift vehicle trips from fossil-fueled to electrically powered vehicles, and therefore it would not contribute to desired reductions in local air and associated greenhouse gas emissions. A rubber-tired alternative would not require a new maintenance and storage facility, but the addition of new vehicles would add to the ongoing need for vehicle maintenance and repairs, with associated energy consumption for those activities. A rubber-tired alternative would not contribute to rail-related noise impacts at the Disney Concert Hall, but those impacts can be effectively mitigated, and therefore no material difference would occur. Future noise increases at other receivers would also not be materially changed, because those increases are primarily attributable to growth in downtown vehicular traffic over time, which would occur irrespective of the alternative implemented.

A rubber-tired alternative would likely not add substantially to the expected intersection impacts, but those impacts are only projected to occur at a maximum of three intersections, depending upon the streetcar alternative; therefore, those differences would also not be material. One impact would be different with a rubber-tired alternative, and that is the potential for bicycle safety hazards associated with streetcar track flangeways, which would not occur with a rubber-tired alternative. The extent to which actual impacts may occur is not known, and therefore the expected differences would be considered speculative at this time.

For the above reasons, a rubber-tired TSM alternative was not carried forward.

### 3.2.3 Alternatives Suggested During Scoping

As part of the CEQA process, a public scoping period was initiated in January 2013 to notify the public of the Project and receive comments. Through this process, 28 commenters provided comments related to the project alternatives, and seven commenters provided comments related to additional alternatives or routes. The following provides a summary of the alternatives suggested during the scoping period. Refer to Appendix C for the Scoping Summary Report.
3.2.3.1 6th Street Alignment

One commenter requested that an alternative route on 6th Street be considered because it would serve the largest office population in downtown (the Financial Core), including Bunker Hill and the Bonaventure and Biltmore hotels. Using 6th Street instead of 7th Street or 9th Street as the connection between Figueroa Street and Hill Street would be feasible, but it would create a portion of “dead track” (i.e., without serviceability) on Broadway between 6th and 7th Streets, because a two-way service connection track on 7th Street between Hill Street and Broadway would still be required.

3.2.3.2 Alternate North/South Alignment

Comments related to the north/south alignment called for considering an alternative alignment to either the Hill Street or Broadway alignments, in order to provide service to a larger geographic area. Although no other north/south alignment was recommended, it was suggested that a two-way alignment on Broadway be considered to improve efficiency.

Placing the two directions of a transit route on different streets, also known as a couplet, has advantages and disadvantages. The advantage of a couplet is that the station stops are spread apart, making them closer to a larger area. The disadvantage is that for some trips, walking distances could be increased. If the different directions are separated by too much distance, then the length of the walk required to return in the opposite direction might make it worthwhile to go to the nearest stop and ride around the loop. The couplet on Hill Street and Broadway was determined by the Alternatives Analysis to be the best compromise.

3.2.3.3 Combined 7th Street Alignment Alternative and 9th Street Alternative

One commenter recommended implementing both the 7th Street Alignment Alternative and the 9th Street Alternative to provide greater service coverage. Operating a streetcar under both the 7th Street Alignment Alternative and the 9th Street Alternative would double the annual operating costs if the same minimum level of service frequency were to be provided on 7th Street and 9th Street as planned for the remainder of the system. The remainder of the system would receive double the planned service frequency, providing service capacity significantly greater than projected ridership. Alternatively, half the service frequency could be provided on 7th Street and 9th Street, with every other train serving one or the other. Including both alternatives would be likely to lead to confusion for riders, which is contrary to the goal of providing a simple, accessible transportation mode. Capital and operation costs would be increased by adding additional route miles and potentially requiring more vehicles. In addition, traffic impacts, both during construction and during operation, would be increased due to redistribution of vehicles on 7th and 9th Streets. Associated air quality and noise impacts would also increase along with these potential traffic impacts.

3.2.3.4 Two-Way Streetcar System

One commenter recommended making the entire Project a two-way system. Building and operating a streetcar system in both directions around the loop could double the capital and operating costs of the Project without providing substantially improved functionality. It would also conflict with the Broadway Streetscape Master Plan (City of Los Angeles 2013a). Furthermore, a two-way streetcar system would create potential conflicts along one-way streets and could result in greater traffic impacts due to the need to accommodate streetcar vehicles in additional traffic lanes. Alternatively, in order to maintain acceptable traffic flow, this alternative would require substantial right-of-way
acquisition affecting numerous historic buildings, displacing residents and businesses, and substantial alteration to existing land use patterns. Accordingly, this alternative would not reduce the environmental impacts of the Project and would not satisfy the project objectives.

3.2.3.5 Personal Rapid Transit

One commenter suggested consideration of a Personal Rapid Transit (PRT) system instead of a streetcar system. A PRT system would consist of an elevated guideway with small, on-demand, accessible, driverless electric vehicles to transport individual passengers to various destinations. A 7-mile route was suggested that would include the study area as well as Little Tokyo, Chinatown, and Dodger Stadium as destinations. The commenter argued that a PRT system would be preferable to streetcar service because it (in stated opinion): (1) would be cheaper to construct while delivering a greater area of coverage, (2) would be quieter, (3) would consume less energy per passenger mile, (4) would not interfere with traffic, (5) would provide greater point-to-point efficiency (6) would provide flexibility to allow station elements to be integrated into new and old buildings, and (7) can be easily expanded in the future because of low cost.

A PRT system was not moved forward for further consideration because it would have greater impacts on the built environment in downtown. Significant space would be needed to accommodate the PRT guideway support columns. If such space cannot be provided outside the street rights-of-way, this could require eliminating at least one traffic lane from public streets, which would result in substantial traffic impacts. In addition, the elevated station platforms would need to be scaled to accommodate peak-period passenger queuing, which would require a large amount of elevated infrastructure that would cast shadows on the streets and sidewalks below as well as potentially obstruct views of historic buildings, substantially altering the visual character of downtown. An elevated guideway would also require a substantial amount of easements in order to cross above private property, which would further restrict the feasibility of implementing such an alternative. For these reasons, a PRT system was not given further consideration.

3.3 Further Modifications Considered

As part of the development of the Project description, further consideration was given to improving the operating speed of the streetcar. Two approaches were considered. First, operational traffic improvements, targeted at selected intersections, were identified, including right-turn lanes (which would help to clear vehicular traffic ahead of the streetcar) and changes to signal phase timing to provide more “green time” for the streetcar. Secondly, the concept of “transit-only lanes” was also considered, which would give the streetcar a dedicated right-of-way within which to operate, in order to increase operating speeds along the route. Southbound Broadway (between 2nd and 11th Streets) was selected as the best opportunity for demonstrating the benefit of this approach. Also considered was reducing the number of proposed stops along the route, which also would improve run times.

The above options were developed and evaluated in a Speed Improvement Study that was conducted between August and September of 2015. The results indicated that the greatest incremental benefit could be achieved by implementing operational improvements at selected intersections along the route, including the recommended turn lane improvements and signal timing changes. It was also determined that only marginal further improvements in run times could be achieved with implementing the transit-only lane option, and reducing the number of stops would also only yield minor benefits. Implementing a transit-only lane would also require major concessions from
existing stakeholders and local plans, including limiting driveway and parking access for some Broadway residents and businesses or eliminating the implementation of the *Broadway Streetscape Master Plan* (City of Los Angeles 2013a) on the east side of Broadway. It was then decided that the proposed list of traffic operation improvements would be advanced.

### 3.4 Summary of the Project and Alternatives Evaluated in the EIR

After the completion of the Alternative Analysis process, the EIR considered four Build Alternatives and a No Build Alternative. These alternatives are listed below. The EIR assessed the Project as Alternative 3 and the Grand Avenue Extension Design Option as Alternative 2.

- **Alternative 1 - No Build Alternative**
- **Alternative 2 - 7th Street Alignment Alternative with Grand Avenue Extension**
- **Alternative 3 - 7th Street Alignment Alternative without Grand Avenue Extension**
- **Alternative 4 - 9th Street Alternative with Grand Avenue Extension**
- **Alternative 5 - 9th Street Alternative without Grand Avenue Extension**

### 3.5 Selection of the Locally Preferred Alternative

Following the Draft EIR public comment period and after examining the Draft EIR comments received during the public comment period, and other relevant information, City Council, in cooperation with the LABOE, LADOT, and Metro, adopted the following as the LPA.

- 7th Street Alignment Alternative without a Grand Avenue Extension;
- Inclusion of the Grand Avenue Extension Design Option, if additional funding can be identified;
- Broadway and 2nd Street MSF site or 11th Street/Olive Street (East) MSF site (Refer to Appendix A, Maintenance and Storage Facility Site Selection Methodology Memorandum);
- Station platform locations to be determined as final design of the Project proceeds; and
- TPSS locations to be determined as final design of the Project proceeds.

The recommended LPA for the Project takes into account a variety of competing priorities, including environmental impacts, economic considerations, safety, accessibility, and funding. According to the environmental analysis, the four proposed build alternatives (Alternatives 2 through 5 stated above) would have nearly equal environmental impacts, with fewer overall traffic impacts associated with the 9th Street Alternative without Grand Avenue Extension (Alternative 5). Given the potential for reduced conflict between bicycles and the streetcar flangeway gaps due to the designated bike lane on 7th Street, the 7th Street Alignment Alternative was identified as the LPA, as it results in lesser impacts related to bicycle safety.

The Project also provides direct connections to a larger number of destinations in downtown, including the Metro Center rail station, the “Fig at 7th” and “The Bloc” shopping centers, and the under-construction “Wilshire Grand” development. Planned streetscape improvements to 7th Street (unrelated to the Project) will also increase access and convenience for users of the streetcar; no such improvements are currently planned for 9th Street.
Chapter 4.0
Affected Environment /
Environmental Consequences

4.1 Resources of No Concern

The following environmental resource areas have no potential to be adversely affected by the Project, including the Grand Avenue Extension Design Option.

4.1.1 Coastal Zones

The Project is approximately 13 miles northeast of the Pacific Ocean and is not located within a defined Coastal Zone. Therefore, the Project would not result in an adverse effect related to coastal zones.

4.1.2 Ecologically Sensitive Areas

The Project would be located in an urbanized area of the City that is covered primarily with structures or concrete and asphalt paving. The areas adjacent to the alignment are nearly completely covered with concrete and asphalt, and landscaped with ornamental trees, shrubs, and ground cover. An environment of this type is not considered to be ecologically sensitive. Furthermore, because of the highly-urbanized surroundings, there are no wildlife corridors in the Project vicinity. The Project is not located within a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, the Project would not result in an adverse effect related to ecologically sensitive areas.

4.1.3 Endangered and/or Threatened Plant and Animal Species

According to the California Department of Fish and Wildlife’s (CDFW) California Natural Diversity Database, 19 special-status species have occurred in the Los Angeles quadrangle within the study area. The areas adjacent to the alignment are primarily urbanized and developed with concrete and asphalt, and typical ornamental landscaping consisting of ornamental trees, shrubs, and ground cover. According to local and regional plans, policies, and regulations, the CDFW, and the U.S. Fish and Wildlife Service, an environment of this type is not considered to be suitable habitat for any of the identified candidate, sensitive, or special-status species. In addition, no known locally designated natural communities are identified in the study area. Therefore, the Project would not result in an adverse effect related to endangered and/or threatened plant and animal species.

Refer to Section 4.15, Construction, for a discussion of tree removal and migratory birds.

4.1.4 Floodplains

Based on the Federal Emergency Management Agency Flood Insurance Rate Map and Exhibit F of the Safety Element of the City of Los Angeles General Plan (DCP 1996), the Project would not be located within a delineated 100-year floodplain. Structures constructed as part of the Project would
not have the potential to redirect flows within a flood zone from a 100-year storm event. Therefore, the Project would not result in an adverse effect related to floodplains.

### 4.1.5 Geology, Soils, and Seismicity (Operations)

The Project would not be located within or adjacent to an Alquist-Priolo Special Study Zone Area or Fault Rupture Study Area (City of Los Angeles 2017). Although its precise location is unknown because of its position deep below the surface, the closest fault is the Elysian Park thrust, which is approximately 2.5 miles to the north. Numerous additional faults are located within 10 miles and in the region at large. All modifications of roadways would be consistent with the *Bureau of Engineering Street Design Manual*. Compliance with building seismic codes and occupational safety and health laws and regulations would also reduce risks to project structures, workers, and the public. Removing all risk associated with building in an earthquake-prone region is not possible, but with adherence to applicable codes and standards, risks would be substantially reduced.

Although the State Division of Mines and Geology identifies the area north and south of the 3rd Street tunnel as an area with previous landslide occurrences or the potential for future landslide movement, the area has been developed since the 1970s as a high-rise senior housing complex. There are no records of landslide occurrences since that time. Because the hillside was graded in compliance with local regulations during construction of Angelus Plaza, the risk of landslides resulting in loss, injury, or death would be minimal. In addition, the location of the slope setback from Hill Street would further reduce the risk to the Project. Based on the previous grading of hillside areas within the Project vicinity, landslides would not pose a hazard to Project facilities.

The study area is underlain by soil types that are not known to have expansive properties. In addition, streetcar vehicles would operate on properly reconstructed street roadways. All areas that would be temporarily denuded during the construction period for track installation would be resurfaced or landscaped. Because existing paved areas would be repaved prior to operation, soil erosion would not occur. Therefore, the Project would not result in an adverse effect related to geology, soils, and seismicity (operations).

### 4.1.6 Hazardous Materials (Operations)

Operation activity would involve the use of common chemicals for cleaning and maintenance of the streetcar vehicles, tracks, and other components. Past and current rail transit operations indicate that active streetcar track beds accumulate petroleum hydrocarbons from the use of lubricants as well as some shavings from the turning of steel wheels on steel rails. The degree of hazard and the magnitude of accumulation would not represent a public health concern because the Project’s rail lubricants would be specified to be biodegradable. Steel shavings would be non-hazardous and produced in small quantities similar to those that occur along light rail lines. For maintenance, the use of chemicals would occur primarily within the enclosed MSF. Furthermore, the chemicals would be used, stored, and disposed of in compliance with existing regulations. Therefore, the Project would not result in an adverse effect related to hazardous materials (operations). Refer to Section 4.15, Construction, for discussion of the Phase I Environmental Site Assessment and related hazards.
4.1.7 Section 6(f) Resources

Section 6(f) does not apply as no parks or recreational properties funded through the Land and Water Conservation Fund would be acquired or improved.

4.1.8 Water Quality and Hydrology (Operations)

The Project may require the relocation or reconfiguration of some storm drains either within street rights-of-way or internal to the selected MSF site. Alterations to the storm drainage system would not change the overall drainage patterns of the area because drainage would be restored to flow via the modified storm drains in the same manner as before the modification was made. No courses of streams or rivers would be altered as a result of the Project because there are no streams or rivers present within the study area. Water may be used to clean the exterior of the MSF on an infrequent basis. Given that the size of the MSF would be 12,000 to 18,000 square feet and no larger than three stories tall, the quantity of water needed to clean the structure would be able to be handled within the capacity of the drainage system. All other water uses at the MSF would be handled by the wastewater system, which is separate from the system for runoff collected from public rights-of-way. The MSF will follow the City of Los Angeles Low Impact Development requirements, which specify, for any project adding more than 500 square feet of building space, that rainwater resulting from a storm event of at least 0.75 inch be captured, infiltrated, and used on site. This will be enforced via review of design plans for the MSF. The Project would not substantially increase the amount of runoff because the impervious surface area of any of the candidate MSF sites would not be increased and may be reduced, due to the construction of the MSF building on what is currently an open parking lot. Onsite runoff would be managed in accordance with City of Los Angeles requirements. In addition, a Standard Urban Stormwater Mitigation Plan (SUSMP) would be implemented for the MSF. The SUSMP would ensure that potential impacts associated with water quality, such as runoff resulting from vehicle cleaning and maintenance, would not be adverse because site-specific requirements would be imposed governing the handling and treatment of runoff from activities occurring within the MSF. Therefore, the Project would not result in an adverse effect related to water quality and hydrology (operations).

4.1.9 Wetlands and Navigable Waterways

According to the U.S. Fish and Wildlife Service’s National Wetlands Inventory, no federally protected wetlands are identified in the vicinity of the Project (U.S. Fish and Wildlife Service 2014). Therefore, the Project would not result in the direct removal, filling, or hydrological interruption of a federally protected wetland, as defined by Section 404 of the Clean Water Act. Therefore, the Project would not result in an adverse effect related to federally protected wetlands (i.e., marsh, vernal pool, coastal, etc.).

Navigable Waterways of the United States as defined by the 33 CFR Section 329.4 are those waters subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. The Los Angeles River is located approximately 1.8 miles east of the alignment. Although sections of the Los Angeles River have been identified as a navigable waterway by the U.S. Army Corp of Engineers, these designated sections are not in proximity to the Project. Therefore, the Project would not result in an adverse effect related to navigable waterways.
4.1.10 Wild and Scenic Rivers

No wild or scenic rivers are identified within the study area. Therefore, the Project would not result in an adverse effect related to wild and scenic rivers.

4.2 Air Quality

This section describes the potential for adverse effects related to air quality. The information presented in this section is based on the *Air Quality and Climate Change Assessment Report*, which is included as Appendix D. Refer to this appendix for a detailed description of the affected environmental that is summarized below.

4.2.1 Affected Environment

Federal Clean Air Act

Air quality in the United States is governed by the federal *Clean Air Act* (CAA), which is administered by the U.S. Environmental Protection Agency (EPA). The CAA establishes federal air quality standards, known as *National Ambient Air Quality Standards* (NAAQS), and specifies future dates for achieving compliance. The CAA also mandates that the state submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards will be met. The City of Los Angeles is within the South Coast Air Basin (Basin) and, as such, is in an area designated a nonattainment area for certain pollutants that are regulated under the CAA.

The *Air Quality and Climate Change Assessment Report* includes a detailed discussion of the NAAQS, the health effects associated with associated pollutants, and the attainment status associated with each pollutant. In summary, the Basin fails to meet national standards for ozone (O₃), inhalable particulate matter (PM₁₀ and PM₂.₅), nitrogen dioxide (NO₂), and lead and is, therefore, designated a federal nonattainment area for those pollutants. The Basin is a maintenance area for carbon monoxide (CO), as a former nonattainment area that has achieved attainment with the CO NAAQS.

Transportation Conformity

Section 176(c)(1) (U.S.C., Title 42, Section 7506) states that “No department, agency, or instrumentality of the federal government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved or promulgated...” A transportation conformity analysis is required to ensure that federally supported highway and transit project activities are consistent with the purpose of the SIP. Conformity with the CAA takes place on two levels—first, at the regional level and second, at the project level. The Project must conform at both levels to be approved.

Federal Hazardous Air Pollutant Regulations

The CAA identified 188 pollutants as being air toxics, which are also known as hazardous air pollutants (HAPs). From this list, the EPA identified a group of 21 toxics as mobile source air toxics (MSATs) in its final rule, *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (66
Federal Register [FR] 17235) in March 2001. From this list of 21 MSATs, EPA in its 2007 rule on the control of HAPs from mobile sources identified seven (acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases [diesel PM], formaldehyde, naphthalene, and polycyclic organic matter) as being priority MSATs. To address emissions of MSATs, the EPA has issued a number of regulations that have and will continue to dramatically decrease MSATs through cleaner fuels and cleaner engines.

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) has jurisdiction over an area of approximately 10,743 square miles, including all of Los Angeles County. The most recently approved air quality management plan (AQMP) is the 2016 update. The 2016 AQMP includes strategies to meet the following NAAQS: 8-hour Ozone (70 ppb) by 2032; annual PM$_{2.5}$ (12 µg/m$^3$) by 2021–2025; 8-hour Ozone (80 ppb) by 2024; 1-hour Ozone (120 ppb) by 2023; and 24 hour PM$_{2.5}$ (35 µg/m$^3$) by 2019. Through the attainment planning process, the SCAQMD develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the Basin. SCAQMD rules most pertinent to the Project include SCAQMD Rule 402 (Nuisance), Rule 403 (Fugitive Dust), Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities). In addition, Regulation XIII (New Source Review), Rule 1401 (New Source Review of Toxic Air Contaminants), or Rule 431.2 (Sulfur Content of Liquid Fuels) may apply to the MSF or TPSS equipment.

Existing Air Quality Conditions

The Air Quality and Climate Change Assessment Report comprehensively discusses pollutants and associated health effects, local meteorology, and existing pollutant levels. To summarize existing pollutant levels:

- 8-hour O$_3$ NAAQS was exceeded multiple times in 2014–2016.
- 24-hour PM$_{10}$ NAAQS was not exceeded in 2013–2016.
- 24-hour PM$_{2.5}$ NAAQS was exceeded once in 2013, several times in 2014 and 2015, and once in 2016.
- 1-hour NO$_2$ NAAQS was not exceeded in 2013–2016.
- No exceedances of the CO NAAQS were recorded.
- The annual standard for PM$_{2.5}$ has been exceeded in 2013–2016, but not for PM$_{10}$.

Sensitive Receptors and Locations

SCAQMD defines sensitive receptor locations as residential, commercial, and industrial land use areas as well as other locations where sensitive populations may be located. Other sensitive receptor locations include schools, hospitals, convalescent homes, day care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be exposed (SCAQMD 2005). The Project would be in the heavily developed downtown Los Angeles area, and streetcars would travel through the following neighborhoods/districts: the Civic Center, Bunker Hill, the Historic Core, the Jewelry District, the Financial Core, South Park, and the Los Angeles Sports and Entertainment District. Sensitive receptor locations within 0.25 mile of the Project include multiple land use categories such as residential, medical, and child care, among other uses.
4.2.2 Environmental Consequences

4.2.2.1 No Build Alternative

**Not Adverse.** Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist in early 2021 and 2040 without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect. However, it is important to note that the No Build Alternative would not result in beneficial air quality effects discussed below for the Project.

4.2.2.2 7th Street Alignment Alternative

**Transportation Conformity**

The conformity requirement is based on CAA Section 176(c), which prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing or approving plans, programs or projects that do not conform to the SIP for attaining the NAAQS.

**Regional Conformity**

The Project is included in SCAG's 2017 FTIP, which was adopted by SCAG on September 1, 2016. The Project was included in FTIP Amendment 17-02, which was approved by SCAG on January 3, 2017 and FTA/Federal Highway Administration (FHWA) on February 21, 2017. The 2017 FTIP Identification Number is LA0G901. The Project is described as "Historic Los Angeles Streetcar." The Project is also in SCAG's RTP/SCS under the same project Identification number and description. The design, concept, and scope are consistent with the description in the FTIP. The regional conformity determination requirement is satisfied.

**Project-Level Conformity**

**Particulate Matter Hot-Spots.** The Project is within a nonattainment area for the federal PM$_{2.5}$ NAAQS and maintenance area for the PM$_{10}$ NAAQS. Therefore, pursuant to 40 CFR Part 93, project-level PM$_{2.5}$ and PM$_{10}$ Interagency Consultation and/or analyses are required for conformity purposes.

A quantitative hot-spot analysis is required only for a project that has been identified as a Project of Air Quality Concern (POAQC), as defined in 40 CFR 93.123(b)(1). As described below, the Project does not meet the criteria that would classify it as a POAQC under EPA's final rule. Accordingly, the Project is not considered to be a POAQC, and the project-level PM conformity determination requirements are satisfied. Confirmation of this finding was obtained following interagency consultation with SCAG's Transportation Conformity Working Group. Under the Project, there would be no adverse effect related to worsening existing or contributing to new localized PM hot spots.

Projects involving new or expanded highway facilities and a significant number of, or a significant increase in the number of, diesel vehicles (significant number is defined as more than 125,000 average annual daily traffic (AADT), with 8 percent or more of such AADT being diesel truck traffic or, in practice, truck AADT of 10,000 or more regardless of total AADT).
A list of projects that are considered to be POAQCs is provided below, along with an analysis of why the Project is not considered to be a POAQC.

1) Projects affecting intersections that are at level of service (LOS) D, E, or F, with a significant number of diesel vehicles, or will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.

2) New bus and rail terminals and transfer points with a significant number of diesel vehicles congregating at a single location.

3) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.

4) Projects in or affecting locations, areas, or categories of sites identified in the PM2.5 or PM10 Implementation Plan or Implementation Plan submission, as appropriate, as sites of possible violation.

The Project is an electrically-powered streetcar transit project that would not directly increase diesel truck traffic on the roadway network. Therefore, the LOS related to increased traffic volumes from a significant number of diesel vehicles is not relevant. In addition, the Project sites have not been identified as possible violation sites in the PM2.5 or PM10 Implementation Plan or Implementation Plan submission. Due to the above reasons, the SCAG's Transportation Conformity Working Group determined on February 28, 2017, that the Project is not considered to be a POAQC.

**Carbon Monoxide Hot-Spots.** Within an urban setting, vehicle exhaust is the primary source of CO. Consequently, the highest CO concentrations are generally found close to congested intersections. Under typical meteorological conditions, CO concentrations tend to decrease as the distance from the emissions source (i.e., congested intersection) increases. For purposes of providing a conservative worst-case impact analysis, CO concentrations are typically analyzed at congested intersection locations. If impacts are less than significant close to congested intersections, impacts will also be less than significant at more distant sensitive-receptor locations.

The Project-specific traffic impact analysis (Intueor 2015) was reviewed to determine the potential for the creation of localized CO hot spots at congested intersection locations. The SCAQMD recommends a hot spot evaluation of potential localized CO impacts when volume-to-capacity (V/C) ratios are increased by 2 percent or more at intersections with LOS D or worse. The traffic impact analysis identified 65 key intersection locations along routes that accommodate much of the traffic traveling within the Project alignment. Of the 65 key intersection locations, the traffic analysis concluded that for opening year (early 2021) and horizon year (2040), five intersections could potentially create a localized CO hot-spot.

For these five intersections, local area CO concentrations were predicted using the CALINE4 traffic pollutant dispersion model with EMFAC2014 emissions factors. Traffic data for the PM peak hour were used, as volumes are generally higher and LOS lower during the PM peak hour than during the AM peak hour. The analysis of CO impacts followed the protocol recommended by Caltrans, published as *Transportation Project-Level Carbon Monoxide Protocol* (Garza 1997, reissued 2010). It is also consistent with procedures identified through the SCAQMD's CO modeling protocol, with all four corners of each intersection analyzed to determine whether project development would result in a CO concentration that exceeds federal standards.

Table 4.2-1 presents the estimated 1- and 8-hour CO concentrations for the existing conditions, the project opening year, and the horizon year. 1-hour or 8-hour local CO concentrations would not exceed the NAAQS.
Table 4.2-1. Modeled Maximum Carbon Monoxide Concentrations (ppm) at Receptors in the Vicinity of Affected Intersections during the PM Peak Hour

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Existing Year 2016&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Opening Year 2020&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Horizon Year 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-hour</td>
<td>8-hour</td>
<td>1-hour</td>
</tr>
<tr>
<td></td>
<td>Exest.</td>
<td>7&lt;sup&gt;th&lt;/sup&gt; St. Alt.</td>
<td>9&lt;sup&gt;th&lt;/sup&gt; St. Alt.</td>
</tr>
<tr>
<td>Olive St./5&lt;sup&gt;th&lt;/sup&gt; St.</td>
<td>6.4</td>
<td>6.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Figueroa St./7&lt;sup&gt;th&lt;/sup&gt; St.</td>
<td>6.4</td>
<td>6.4</td>
<td>6.3</td>
</tr>
<tr>
<td>Figueroa St./8&lt;sup&gt;th&lt;/sup&gt; St.</td>
<td>6.8</td>
<td>6.9</td>
<td>6.8</td>
</tr>
<tr>
<td>Olive St./9&lt;sup&gt;th&lt;/sup&gt; St.</td>
<td>7.3</td>
<td>7.3</td>
<td>7.5</td>
</tr>
<tr>
<td>Figueroa St./Olympic Blvd.</td>
<td>6.8</td>
<td>6.8</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Sources: EMFAC2014 and CALINE4 modeling by ICF (2016); Intueor 2015.

<sup>a</sup>Traffic data for 2014–2015.

<sup>b</sup>The traffic analysis was prepared assuming streetcar operations would begin in late 2020. It has been determined that operations would now begin six months later than previously assumed for the Project resulting in a 2021 opening date. Nevertheless, the traffic analysis considered impacts running through a 2040 horizon date, concluding the Project will have no detrimental impacts through that horizon date. A six-month delay in the opening date does not substantially alter this analysis. In addition, within the EMFAC2014 model, CO emissions decrease in future years due to fleet turn over and improvements in engine exhaust technology.

Background concentrations of 5.1 and 4.6 ppm were added to the modeling for 1- and 8-hour results, respectively, based on SCAQMD projected future-year concentrations for Central Los Angeles (SCAQMD 2014a, 2014b).

The federal 1- and 8-hour standards are 35 and 9 ppm, respectively.
Because impacts would not occur at the intersections with the highest traffic volumes or lowest LOS located adjacent to sensitive receptors under any alternative, no impacts are anticipated to occur at any other locations in the study area because the conditions yielding CO hot spots would not be worse than those occurring at the analyzed intersections. Consequently, the sensitive receptors that are included in this analysis would not be affected by CO emissions generated by increases in traffic that could occur with Project. The CO hot-spot requirement is satisfied.

**Effect AQ-1: Criteria Pollutant and Ozone Precursor Emissions**

**Beneficial.** Regional air pollutant emissions associated with operations would result from (1) the net change in passenger VMT that would occur within the study area under the Project compared to the No Build Alternative; (2) employee trips (mobile source) and energy demand (area and stationary-source) emissions related to MSF lighting, water heating, and temperature control; and (3) the emissions from electricity generation needed to power streetcar operations.

The Project is anticipated to result in a daily reduction of VMT due primarily to diversion of private automobile trips to the transit system. The CT-EMFAC2014 model was used to estimate the emission reductions. It is anticipated that the Project would reduce VMT by 6,327 and 7,431 miles per day in early 2021 and 2040, respectively. Table 4.2-2 shows estimated emission reductions associated with the Project.

**Table 4.2-2. Estimated Change in Passenger Vehicle Emissions due to VMT Reduction during Operations (pounds per day)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Alternative</th>
<th>Pb</th>
<th>ROG</th>
<th>NOX</th>
<th>CO</th>
<th>SOX</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPENING YEARb</td>
<td>Project</td>
<td>0</td>
<td>(7)</td>
<td>(7)</td>
<td>(19)</td>
<td>(&lt;1)</td>
<td>(1)</td>
<td>(&lt;1)</td>
</tr>
<tr>
<td></td>
<td>Project with Grand Avenue Extension</td>
<td>0</td>
<td>(5)</td>
<td>(9)</td>
<td>(24)</td>
<td>(&lt;1)</td>
<td>(1)</td>
<td>(&lt;1)</td>
</tr>
<tr>
<td>HORIZON YEAR</td>
<td>Project</td>
<td>0</td>
<td>(2)</td>
<td>(7)</td>
<td>(10)</td>
<td>(&lt;1)</td>
<td>(1)</td>
<td>(&lt;1)</td>
</tr>
<tr>
<td></td>
<td>Project with Grand Avenue Extension</td>
<td>0</td>
<td>(3)</td>
<td>(9)</td>
<td>(13)</td>
<td>(&lt;1)</td>
<td>(1)</td>
<td>(&lt;1)</td>
</tr>
</tbody>
</table>


a In 1996, the EPA phased out the use of lead as a fuel additive for on-road vehicles. As such, current fuel blends for on-road vehicles contain no lead. Therefore, on-road motor vehicle exhaust contains no lead emissions.

b The ridership analysis was prepared assuming streetcar operations would begin in late 2020. It has been determined that operations would now begin six months later than previously assumed for the Project resulting in a 2021 opening date. Nevertheless, the ridership forecast considered both ridership and VMT reductions through the year 2040, and indicated that both ridership and VMT reductions would increase throughout that period. A six-month delay in the opening date does not substantially alter this analysis. In addition, within the EMFAC2014 model, pollutant emissions decrease in future years due to fleet turnover and improvements in engine exhaust technology.

Note: Emissions are based on VMT estimated developed for the EIR. The VMT analysis has since been updated resulting in additional Project-related VMT reductions of 603 and 664 miles per day in early 2021 and 2040, respectively. The Project with Grand Avenue Extension would result in additional VMT reductions of 559 and 687 miles per day in early 2021 and 2040, respectively. It is anticipated that emission reductions would be slightly greater than what is shown in this table due to the higher VMT reduction.
The CalEEMod model was used to estimate emissions related to MSF operations. Emissions related to streetcar operations were based on the estimates of system energy demand, which include emissions related to energy demand (e.g., TPSS Units) and employee trips. Table 4.2-3 shows that the Project would result in a reduction or negligible change in total emissions. SCAQMD significance thresholds are shown for reference. Therefore, the Project would result in a beneficial effect related to criteria pollutant and ozone precursor emissions.

### Table 4.2-3. Estimate of Operations-Period Mass Emissions (pounds per day)

<table>
<thead>
<tr>
<th>Emissions Source</th>
<th>Pb</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SOx</th>
<th>PM_{10}</th>
<th>PM_{2.5}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Passenger Vehicle Emissions</td>
<td>0</td>
<td>(5)</td>
<td>(8)</td>
<td>(27)</td>
<td>(&lt;1)</td>
<td>(1)</td>
<td>(&lt;1)</td>
</tr>
<tr>
<td>Maintenance Facility Emissions</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>&lt;1</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Streetcar Operations Emissions</td>
<td>0</td>
<td>&lt;1</td>
<td>3</td>
<td>2</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Total Project Emissions</td>
<td>0</td>
<td>(4)</td>
<td>(3)</td>
<td>(18)</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>


* In 1996, the EPA phased out the use of lead (Pb) as a fuel additive for on-road vehicles. As such, current fuel blends for on-road vehicles contain no lead. Therefore, on-road motor vehicle exhaust contains no lead emissions.

Note: CT-EMFAC and CalEEMod modeling output sheets are provided in Appendix D.

**Effect AQ-2: Mobile Source Air Toxics**

**Beneficial.** The purpose of the Project is to enhance mobility and transit circulation in downtown Los Angeles. The Project has been determined to generate beneficial air quality impacts related to CAA criteria pollutants and has been shown not to result in MSAT concerns. While the Project would not result in substantial changes in traffic volumes or vehicle fleet mix, VMT would be reduced when compared to the No Build Alternative. As MSAT emissions are a function of VMT, reductions in VMT would lead to reductions in project vicinity MSAT emissions. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA’s MOVES model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while during this same time vehicle-miles of travel are projected to increase by over 100 percent (FHWA 2012). This will further reduce the background level of MSAT. Therefore, the Project would result in a beneficial effect related to MSAT emissions.

#### 4.2.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would further reduce pollutant emissions beyond the reductions estimated for the Project. The additional alignment would increase ridership by 1,679 riders in early 2021 and 2,390 riders in 2040. This would result in an additional VMT reduction of 1,404 miles per day in early 2021 and 1,862 miles per day in 2040. As shown in Table 4.2-2, above, there would be a reduction in mobile-source emissions with the Grand Avenue Extension. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would result in a beneficial effect related to air quality and would not result in an adverse effect related to transportation, regional, or project level conformity.
4.2.3 Measures to Minimize Harm

Operational effects related to air quality would not be adverse. No measures to minimize harm are required.

4.3 Community Effects

This section describes the potential for adverse effects related to community cohesion. The analysis includes discussions related to community character, housing, and community facilities and services. Refer to Section 4.6, Environmental Justice, for an additional assessment of community effects and Section 4.9, Land Acquisition, Displacements, and Fiscal Impacts, for the assessment of community-related economic effects.

4.3.1 Affected Environment

There are no federal statutes or regulations related to community and neighborhood impacts. FTA provides general guidance to assist with NEPA determinations regarding the significance of community and neighborhood impacts, which may include the creation of physical or psychological barriers; changes in land use patterns, circulation patterns, or access to services; changes in population densities; and effects on neighborhood cohesiveness.

The study area generally encompasses the area bounded by Cesar Chavez Avenue on the north, Interstate 10 on the south, Interstate 110 on the west, and Alameda Street on the east. This area is an urban environment where major transportation facilities and dense development exists. The study area is located within the Central City Community Plan area. The Central City Community Plan identifies nine districts: Civic Center, Bunker Hill, Financial Core, South Park, Convention Center/Arena, Center City/Historic Core, Central City East, South Markets, and Little Tokyo.

Section 4.10, Land Use and Zoning, includes a detailed discussion of each of the nine districts and land uses. In summary, the study area contains industrial, commercial, multi-family residential, public facilities, and open space land uses. In general, industrial land uses are located in the southeastern portion of the study area, in the South Markets District. Commercial land uses are located primarily in the central, southern, and eastern portions of the study area. In recent years, areas along the Project alignment have seen a marked increase in residential and mixed-use land uses, with approximately 9,400 housing units built in downtown between 2000 and 2012. Within the Civic Center, many land uses are government-owned buildings that employ city, state, and federal workers. The multi-family residential areas range from the single-resident occupancy hotels in the Central City East area to the high-rise condominiums and apartments in the South Park neighborhood. There are multi-family residential areas on Bunker Hill, adjacent to Broadway on Spring Street, and on 9th Street. Public facilities are clustered primarily in the northern part of the study area, in the Civic Center, and the southern area, which surrounds the Convention Center. The largest open spaces in the study area are Grand Park in the Civic Center, Pershing Square in the Financial District, and Spring Street Park.
4.3.2 Environmental Consequences

4.3.2.1 No Build Alternative

**Not Adverse.** Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.

4.3.2.2 7th Street Alignment Alternative

**Effect COM-1: Community Character**

**Not Adverse.** The Project would improve circulation within and among the different districts located in the Central City Community Planning area, including the Civic Center, Bunker Hill, Financial Core, South Park, and the Center City/Historic Core Districts of downtown Los Angeles. The streetcar would operate within existing street rights-of-way that would be shared with motor vehicles and pedestrians. Streetcars historically operated along the streets in the study area, and the restoration of streetcar service would not visually diminish the cohesive nature of the districts, as conveyed by architectural style, materials, setbacks, and storefronts, because overhead wires, poles, street lamps, and traffic signals have been and are part of the historic and current setting. Generally, development pressures can lead to changes in the character of a community; however, land use safeguards have been adopted by the City to ensure aesthetic compatibility, including the **Broadway Theater and Entertainment District Design Guide**, **Historic Downtown Design Guidelines (HDLADG)**, **Downtown Los Angeles Design Guide**, **Broadway Streetscape Master Plan (BSMP)**, **Figueroa Corridor Streetscape Project**, and street standards. Refer to Section 4.10, Land Use and Zoning, for a discussion of these land use plans and consistency with existing land use patterns. Refer to Section 4.14, Visual Quality, for a discussion of effects related to the character of the existing built environment. Also, refer to Section 4.13, Transportation and Traffic, for a discussion of effects related to circulation patterns. The Project would not substantially degrade the community character or create a negligent or unappealing community landscape. Therefore, the Project would not result in an adverse effect related to community character.

**Effect COM-2: Housing**

**Not Adverse.** The Project would not involve the construction of housing or the displacement of any residents. Refer to Section 4.9, Land Acquisition, Displacements, and Fiscal Impacts, for a discussion of displacement. The Project would support the future construction and operation of new residential units in downtown Los Angeles by contributing to conditions that would be conducive to additional investment. The Project would not result in any housing displacement and is not otherwise anticipated to result directly in any impacts to the downtown housing market, including not resulting in increased property values in a manner that may adversely affect low-income or single-room housing availability. Therefore, the Project would not result in an adverse effect related to housing.
**Effect COM-3: Community Facilities and Services**

**Not Adverse.** No community facilities would be relocated as a result of implementing the Project or its associated TPSS and MSF. The circulation improvements associated with the Project would be limited to downtown Los Angeles. The School for Integrated Academics and Technologies, a public charter high school, and the Fashion Institute of Design and Merchandising are within 100 feet of the Project alignment. Refer to Section 4.12, Safety and Security, for a discussion related to pedestrian safety and emergency services. Also, refer to Section 4.7, 4(f) Resources, for a discussion of parks. The Project would not directly contribute to community growth leading to new demand for parks, schools, churches, or other community facilities. Therefore, the Project would not result in an adverse effect related to community facilities and services.

**4.3.2.2.1 Grand Avenue Extension Design Option**

Implementation of the Grand Avenue Extension Design Option would not affect the Project-related analysis presented above for community character, housing, and community facilities and services. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would not result in an adverse effect related to community character, housing, or community facilities and services.

**4.3.3 Measures to Minimize Harm**

Operational effects related to community effects would not be adverse. No measures to minimize harm are required.

**4.4 Cultural Resources**

This section describes the potential for effects related to cultural resources. The information presented in this section is based on the *Historic Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project* (ICF International 2016) and the *Archaeological Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project* (ICF International 2016), which is included as Appendices E and F. The affected environment and environmental consequences are summarized below. Refer to Section 3.13, Cultural Resources, of the Draft EIR for a detailed description of the affected environment.

**4.4.1 Affected Environment**

The Project is an undertaking under Section 106 of the *National Historic Preservation Act* (NHPA) (54 U.S.C. Section 306108) because funding assistance is being sought by the City from FTA. The survey of cultural resources and evaluation which are listed in or meet the criteria for listing in the *National Register of Historic Places* (NRHP) were completed in accordance with the implementing regulations of Section 106 of the NHPA (36 CFR Part 800).

The implementing regulations for Section 106 set forth a four-step process for compliance. Initiation of the Section 106 process includes the establishment of an undertaking, identification of the appropriate State Historic Preservation Officer (SHPO), and coordination with other reviews, such as NEPA (36 CFR 800.3). In the second step, the Area of Potential Effects (APE) is established and historic properties are identified. During this step, information from interested parties is sought,
and SHPO is consulted regarding the eligibility of historic properties in the APE (36 CFR 800.4). Following this, in step three, the criteria of adverse effects are applied to those properties that have been identified as NRHP-listed or eligible, and SHPO concurrence is obtained (36 CFR 800.5). Finally, adverse effects are resolved in step four, either through avoidance, minimization, or mitigation, resulting in either a change to the Project or the execution of a Memorandum of Agreement (36 CFR 800.6).

The APE has been defined as those parcels adjacent to the corridors described in Chapter 2.0, Purpose and Need including the Grand Avenue Extension. This would encompass all project components, including TPSS unit locations and MSF sites.

To determine whether an undertaking could affect NRHP-listed or -eligible properties, cultural resources (including archaeological, historical, and architectural properties) must be inventoried and evaluated for listing in the NRHP. For projects involving a federal agency, cultural resources significance is evaluated in terms of eligibility for listing in the NRHP. For a property to be considered for inclusion in the NRHP, it must meet the criteria for evaluation set forth in 36 CFR Part 60.4, as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of design, setting, materials, workmanship, feeling, and association and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history.

Among other criteria considerations, a property that has achieved significance within the last 50 years is not considered eligible for inclusion in the NRHP unless certain exceptional conditions are met.

The affected environment is also informed by several local regulations, including the City's Cultural Heritage Ordinance as Historic-Cultural Monuments (HCM), HDLADG, and BSMP. The HDLADG were developed to aid in implementing effective preservation and adaptive reuse projects that protect, highlight, and promote downtown's historic character. Based on the Secretary of the Interior's Standards for the Treatment of Historic Properties, the HDLADG apply to properties located along portions of Main, Spring, and Hill Streets, Broadway between approximately 3rd Street on the north and 9th Street on the south. This district contains a significant concentration of historic office buildings, department store buildings, and the largest and most architecturally impressive collection of early twentieth-century movie theaters found anywhere in the United States. Although focused almost entirely on building design, retrofit, maintenance, appropriate building addition design and integration, and signage design, HDLADG guidance is premised on the eventual reintroduction of streetcars and/or trolley lines in the Historic Downtown neighborhood. The HDLADG states that
new construction should be planned so that it results in minimal impacts on primary historic building façades.

The BSMP provides a vision for design improvements along Broadway, a menu of design tools and streetscapes, and other design criteria germane to design within individual street blocks. Under the provisions of the BSMP, street curb extensions, crosswalk and street paving, transit stop locations, and all signage (including wayfinding and informational signage) require review by the City Planning Department. Also under the BSMP, LADOT reviews all street right-of-way changes to median strips, crosswalks, bus stop locations, directional and informational signage, bicycle facilities, and any changes to the standard LADOT menu of hardware, colors, and materials. Although there are numerous non-historic replacement streetlight poles along Broadway, the surviving so-called "Broadway Rose" streetlight bases are considered worthy of retention as part of the streetscape proposed under the BSMP (even though they are not considered historic elements). These bases, as well as historic terrazzo sidewalk installations, historic sidewalk vault lights, basement vault hatch doors, flagpole holders, and utility and ventilation covers, are itemized in the BSMP and are considered character-defining historic fabric.

Archaeological Context

A detailed archaeological context of downtown Los Angeles can be found in Historic Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ICF International 2016) and the Archaeological Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ICF International 2016), which is included as Appendices E and F. This abbreviated context focuses only on the streetcar alignment in the study area.

Prehistoric Setting

The prehistoric occupation of Southern California is divided chronologically into four temporal phases or horizons (Moratto 1984). Horizon I, or the Early Man Horizon, began at the first appearance of people in the region, approximately 12,000 years ago, and continued until about 7000 years Before Present (B.P.). Although little is known about these people, it is assumed that they were semi-nomadic and subsisted primarily on game.

Horizon II, also known as the Millingstone Horizon or Encinitas Tradition, began around 7000 B.P. and continued until about 3500 B.P. The Millingstone Horizon is characterized by widespread use of milling stones (manos and metates), core tools, and few projectile points or bone and shell artifacts. This horizon appears to represent a diversification of subsistence activities and a more sedentary settlement pattern. Archaeological evidence suggests that hunting became less important and that reliance on collecting shellfish and vegetal resources increased (Moratto 1984).

Horizon III, the Intermediate Horizon or Campbell Tradition, began around 3500 B.P. and continued until about 1000 B.P. Horizon III is defined by a shift from the use of milling stones to increased use of mortar and pestle, indicating a greater reliance on acorns as a food source. Projectile points become more abundant and, together with faunal remains, indicate increased use of both land and sea mammals (Moratto 1984).

Horizon IV, the Late Horizon, which began around 1000 B.P. and terminated with the arrival of Europeans, is characterized by: dense populations; diversified hunting and gathering subsistence
strategies, including intensive fishing and sea mammal hunting; extensive trade networks; use of the bow and arrow; and a general cultural elaboration (Moratto 1984).

Native American Ethnographic Setting

The APE lies within Gabrielino/Tongva ethnographic territory. The term Gabrielino refers to Native American groups historically associated with the San Gabriel Mission. Gabrielino territory is not well defined, but is generally believed to incorporate the watersheds of the Los Angeles, San Gabriel, and Santa Ana Rivers. It includes the entire Los Angeles Basin, the coast between Aliso Creek and Topanga Creek, and the islands of San Clemente, San Nicholas, and Santa Catalina. The ancestors of the Gabrielinos likely arrived in the Los Angeles Basin around 2500 B.P. as part of what Kroeber (1925) referred to as the “Shoshonean Wedge.” By 1500 B.P., permanent villages were built in the lowlands along rivers and streams. Over 50 villages may have been occupied simultaneously with populations of between 50 and 200 people per village (Bean and Smith 1978).

Gabrielino houses were primarily domed, semi-subterranean, thatched structures of locally accessible materials including tule, fern, and carrizo. Principal game included deer, rabbit, fish, sea mammals, jackrabbit, woodrat, mice, ground squirrels, antelope, quail, and other birds. Acorns were the most important single food source and villages seem to have been located near water resources necessary for the leaching of acorns. Grass seeds were the next most abundant food source. Seeds were parched, ground, and cooked as a mush in various combinations. Additional food sources included various greens, cactus pods, yucca buds, bulbs, roots, and tubers (Bean and Smith 1978). Tools for food acquisition, storage, and preparation included an inventory made from widely available materials. Hunting tools included shoulder-height bows with fire-hardened wood or stone-tipped arrows, curved throwing sticks, rabbit nets, slings, and traps. Seeds were ground with handstones on shallow basin metates. The same granites were made into mortars and pestles for pounding acorns or small game. Coiled and twined baskets and steatite bowls were used in food gathering, preparation, storage, and serving. Other utensils for food preparation included wooden food paddles, brushes, tongs, tweezers, and wooden digging sticks (Bean and Smith 1978).

One major ethnographic Gabrielino village close to the project site was the village of Yaanga, one of the largest Gabrielino villages in the region. Its precise location is uncertain because the original community was abandoned sometime prior to 1836 (Robinson 1952:16) Yaanga was likely located slightly to the south of the old Spanish Plaza of Pueblo de Los Angeles, near where the former Bella Union Hotel was later built (Dillon 1994:30) on Main Street, above Commercial Street (Newmark 1916:25–26). The reference to this well-known nineteenth-century Los Angeles hotel places this village location about two city blocks northwest of the project site. The village of Yaanga was later instrumental in the founding of Pueblo de Los Angeles because the Spanish Colonial governor wanted a Native American village population to support the new civil community with labor and materials.

Historic Context

A detailed historic context of downtown Los Angeles can be found in Historic Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ICF International 2016) and the Archaeological Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ICF International 2016), which is included as
Appendices E and F. This abbreviated context focuses only on the streetcar alignment in the study area.

**Downtown Development and the Streetcar**

The development of downtown and Greater Los Angeles was inexorably linked to the early transportation systems in the City. Although the historic core of downtown (streets like Temple, Main, Spring, Broadway, and Hill) was not as dependent on streetcar lines for residential growth as outlying areas, the streetcar played an important role in transporting the necessary workers and retail consumers from distant areas to downtown. Early subdivision activity adjacent to the pueblo and Main Street expanded outward along horse car, cable car, and electrified streetcars in the 1870s and 1880s. Cable cars and electric streetcars had the greatest impact on neighborhoods just outside the historic core. (Los Angeles Conservancy 1990: II-11–II-12). Figure 4.4-1 shows a streetcar on Broadway in 1926.

![Figure 4.4-1. Looking south down Broadway at the intersection of 5th Street in 1926. Streetcars proceed down the center of Broadway. Source: Los Angeles Public Library](image)

By the mid-1890s, electrified interurban streetcars connected downtown to cities as far as Pasadena and Santa Monica. With a downtown now conveniently accessible to outlying areas, department stores on 7th Street and theaters on Broadway could draw enough people to create a major hub of business, retail, and entertainment activity. By 1911, the region had a streamlined system that focused on downtown, making it the single most accessible point in Southern California. The completion of the Subway Terminal Building at 417 South Hill Street in 1925 would help shift the
center of downtown activity farther to the west from the traditional Main Street corridor. The terminal’s completion coincided with the growth of retail stores on 7th Street that were west of Broadway (Roseman 2004: 7–11).

Downtown Neighborhoods

Bunker Hill and Angels Flight

Of the neighborhoods, directly adjacent to the historic core of downtown Los Angeles, Bunker Hill (originally called “Olive Hill”) was among the first to have its initial development tied directly to the expansion of the streetcar system in Los Angeles. The modern boundaries of Bunker Hill consist of Temple Street to the north, 5th Street to the south, Olive Street to the east, and the Harbor Freeway to the west (Comer 1996:16–18).

Although some residences dotted the landscape of Bunker Hill prior to the 1880s, the development of the area was hindered by steep topography. The hill proved especially inaccessible to early horse-drawn streetcars, which were prevalent in downtown during the 1870s and 1880s. When cable car technology was introduced to Los Angeles by the late 1880s, streetcars could finally travel the steep terrain of Bunker Hill. The Temple Street Cable Railway ran three miles from Main Street to the Dayton Heights neighborhood along Temple Street, while the 2nd Street Cable Railroad ran along 2nd Street from Spring Street to Texas Street. Streetscapes, water systems, and other infrastructure improvements also made the area more attractive to investment. Bunker Hill would soon experience an intensive residential building boom, which resulted in a number of fashionable Queen Anne and Eastlake style dwellings at the crown of the hill (Post 1989:49–52). Figure 4.4-2 shows Angels Flight in 1901.

Figure 4.4-2. A View of 3rd Street, 3rd Street Tunnel, and Angels Flight (to the left) in 1901.

Source: Los Angeles Public Library

The construction of the Angels Flight Railway in 1901 provided a method for traveling the steepest portion of Bunker Hill, near 3rd Street, which had no streetcar access at the time. Although the 3rd Street tunnel was constructed under Bunker Hill in 1901, it did not provide access to the top of the hill. Increased housing density in Bunker Hill, along with development of the commercial core to
the east and south of the line, helped ensure strong patronage. After opening in December 1901, the railway became an important connection between the residential hillside and the commercial core to the east. Development of Bunker Hill would continue to intensify as stately hotels and apartment buildings would be added to the existing fabric of single-family dwellings (Comer 1996:35–42).

**Broadway Theatre and Commercial District**

The Broadway Theatre and Commercial District was listed on the NRHP on May 9, 1979. The original NRHP district, which encompassed 300 to 939 South Broadway, was expanded on April 12, 2002, to now encompass 242 to 947 South Broadway.

The Broadway District is highly representative of a commercial and entertainment center in downtown Los Angeles that emerged principally in the first quarter of the twentieth century. The area consists of a collection of large office buildings, department stores, and theaters designed in traditional architectural styles, such as Beaux Arts. Construction of the new city hall on Broadway during the 1890s was a primary impetus for changing the neighborhood from a residential to a commercial district. Large business structures, such as the Bradbury Building, the Grand Central Market, the Nelson Building, and the Jacoby Brothers Store began to change the Broadway skyline and pulled the downtown business center farther to the south from 3rd Street. (Roseman 2004:61–63). Figure 4.4-3 shows Broadway in 1928.

![Figure 4.4-3. Crowds crossing the intersection of 7th Street and Broadway, looking north on Broadway in 1928. A Yellow Car is seen in the foreground on Broadway while a Red Car (on the right side) is about to cross Broadway along 7th Street.](image)

Source: Los Angeles Public Library

During the first half of the twentieth century, the Los Angeles streetcar system made the district accessible to patrons throughout Los Angeles. By the early 1900s, the Los Angeles Railway Yellow Cars became a familiar sight along Broadway as they carried shoppers, theatergoers, and workers to...
their desired destinations with regular stops along the route. The interurban Red Cars also played a role by transporting people to Broadway from outlying suburban locations in Southern California. Before the widespread use of automobiles and the development of the freeway system, the streetcars provided an important link between downtown commerce and the greater Los Angeles region (Los Angeles Conservancy 1990:II-25–II-28).

The theaters on Broadway are of particular historical importance because they provided a center for drama, comedy, and vaudeville presentations in Los Angeles before the advent of motion pictures. A number of Broadway’s theaters from this period continue to convey cultural and architectural significance. Among the earliest theaters built on Broadway are the Cameo at 528 South Broadway, the Arcade at 534 South Broadway, and the Palace at 630 South Broadway. Figure 4.4-4 shows Broadway in 1944.

![Figure 4.4-4. Looking north on Broadway from 7th Street during the Armistice Day parade in 1944. Yellow Cars are seen in the center of the street.](image)

Movie palaces in the district reached an even more elevated level of grandeur with the construction of the Million Dollar Theater at 307 South Broadway in 1918. Albert C. Martin designed the richly detailed Churrigueresque style building for the legendary showman Sid Grauman. The theater also helped usher in an era of increasingly grand theaters along Broadway in the 1920s. The 2,190-seat Orpheum (842 South Broadway) was constructed in 1926 in the Beaux Arts style and would play host to many of the biggest names in show business. A year after the construction of the Orpheum, the Gothic-themed United Artist Theatre opened. The building was the product of the prolific Los Angeles-based architects Walker and Eisen, who designed other noteworthy buildings downtown. Theater construction in the district reached its apex in 1931 when the last of the great movie palaces, the Los Angeles Theatre, was opened at 615 South Broadway. Designed by Charles Lee, the
lavish French Baroque-inspired building is distinguished by its huge accented columns on the primary façade. Other theaters from the period include the Roxie at 518 South Broadway, the Globe at 744 South Broadway, the Tower at 802 South Broadway, and the Rialto at 812 South Broadway (Gebhard and Winter 2003:249–251).

**Spring Street Financial District**

The Spring Street Financial District was listed on the NRHP on September 12, 1978, and is located from 354 to 704 South Spring Street. For most of the twentieth century, Spring Street served as the business center of Los Angeles. Once known as the "Wall Street of the West" for its concentration of banks and other financial institutions, the district consists of an architecturally homogeneous collection of buildings along Spring Street, from 7th Street north to 4th Street. Architecturally, Neo-Classical, Commercial, and Art Deco buildings with grand terra cotta façades define this neighborhood. Figure 4.4-5 shows Spring Street in 1932.

![Figure 4.4-5. View of Spring Street looking north between 6th and 7th Streets in 1932. On the right is the Los Angeles Stock Exchange building (later the Pacific Coast Stock Exchange). A Yellow Car is traveling south down Spring Street.
Source: Los Angeles Public Library](image)

Although the Spring Street Financial District is east of the study area for the Project, it is discussed as part of the historic context because the Spring Arcade Building, which is listed as a contributor to both the Spring Street Financial District and the Broadway Theatre and Commercial District, is in the study area. The address for the Spring Arcade Building is 538–544 Broadway and 531–545 Spring Street.
7th Street

During the 1910s and 1920s, 7th Street developed as a commercial district noted for its upscale retail and distinctive office architecture, which continues to define its modern built environment. The area is roughly a mile south of the original pueblo and had been agricultural land until the first residences began to appear in the late 1870s. Due to the commercial expansion of downtown in the early 1900s, the street evolved farther from residential to commercial uses. The growth of the area by the 1910s represented a transition in downtown commercial retailing from turn of the century, mixed-use buildings to the larger, single-use, specialized buildings. By 1920, 7th Street featured a number of major retailers and attracted thousands of shoppers, many of which arrived on streetcars. The Yellow Cars provided many stops along the street and became a popular mode of transportation for downtown visitors. The corner of 7th Street and Broadway would soon become one of the most bustling intersections in the City due to a plethora of nearby retail and entertainment establishments. The 7th Street corridor continued to grow throughout the 1920s with the addition of several large-scale office buildings. The architectural character of the street was typified by Beaux Arts style buildings constructed in the early twentieth century. Several of these buildings had undergone façade makeovers in the Art Deco style by the 1930s (Los Angeles Conservancy 1990:II-26–II-28). Figure 4.4-6 shows the intersection of Broadway and 7th Street in 1926.

Figure 4.4-6. A view of the intersection of Broadway and 7th Street, looking west on 7th Street in 1926. On the corner is the Loew’s State Theatre. Streetcars are seen at the center of the street.

Source: Los Angeles Public Library

Both the Bullock’s Department Store and the J. W. Robinson Company served as two of the early catalysts for retail growth along the 7th Street corridor. John Bullock set the tone for the area’s specialized, upscale department store theme when he opened his flagship Bullock’s store at the corner of Broadway and 7th Street (319 West 7th Street) in 1906. The store would experience continued expansion at the location and eventually occupy six adjoining structures. In 1915, J. W.
Bullocks Company opened the first major department store on 7th Street to the west of Broadway. Located at 600 West 7th Street, the store became an immediate success and spurred a westward expansion of commercial business along the street in an area that had been previously been considered the outskirts of the downtown retail core. Additional retail buildings from the period include the Coulter Dry Goods Company Building at 518 West 7th Street, Ville de Paris at 420 West 7th Street, and later the Barker Bros. Building at 818 West 7th Street. The Renaissance Revival Style Barker Bros. Building is of particular significance because it was among the largest furniture stores in the country and features a remarkable exterior façade that remains in nearly original condition (Los Angeles Conservancy 2010:1-6).

The construction of single-use office buildings added another component to the architectural fabric of 7th Street. Between 1920 and 1928, 13 large office buildings were constructed on 7th Street alone. Built in 1911, the Union Oil Building at 215 West 7th Street represents one of the earliest examples of this large, spacious type of office construction. Office buildings from the 1920s include the Romanesque style Fine Arts Building at 811 West 7th Street, the Bank of Italy at 505 West 7th Street, the Financial Center Building at 140 West 7th Street, the Transportation Building at 122 East 7th Street, and the Roosevelt Building at 727 West 7th Street. The massive Renaissance Revival style Roosevelt Building was said to have been the largest office building in Southern California upon its opening. The Financial Center Building stands as yet another example of Beaux Arts style along the street and is listed on the NRHP. Both the Fine Arts Building and the Transportation Building display the stylish and artistic work of architects Walker and Eisen (Gebhard and Winter 2003:238, 252). Figure 4.4-7 shows the northeast corner of Flower Street and 7th Street in 1940.

![Figure 4.4-7. Northeast corner of Flower and 7th Streets looking at the east elevation of the Roosevelt Building circa 1940. A streetcar is traveling east on 7th Street.](Source: Los Angeles Public Library)
In addition to retail and office buildings, 7th Street was also home to theater venues near Broadway and the Los Angeles Athletic Club. Two theaters of particular note are the Pantages Theatre at 401 West 7th Street and the Loew’s State Theatre at 300 West 7th Street. The Los Angeles Athletic Club, a local institution, moved to its current location at 431 West 7th Street in 1912 with a layout that included a clubhouse, athletic facility, and hotel. It also featured an Olympic-size pool on the sixth floor, which

**South Park**

The neighborhood commonly referred to as South Park encompasses an area roughly bounded by 8th Street to the north, the Santa Monica Freeway to the south, Main Street to the east, and the Harbor Freeway to the west. The name “South Park” is a fairly recent moniker created for the marketing and redevelopment of the neighborhood; historically, it was not referred to by this name. The neighborhood was first developed as a middle-class residential area during the 1880s and evolved into an area characterized by medical, commercial (especially automotive related), and retail businesses intermixed with residential flats, apartments, and rooming houses during the twentieth century.

South Park was traditionally recognized as the home to two important institutions during the first half of the twentieth century: William Randolph Hearst’s *Examiner* newspaper (later the *Herald-Examiner*) and the California Hospital. The building formerly occupied by the *Herald-Examiner* at 1111 South Broadway was constructed in 1914 and designed by renowned architect Julia Morgan in association with William Dodd and William Richards. The striking Mission Revival style building with Italian Revival and Moorish influences stands as one of Morgan’s few works in Los Angeles. Figure 4.4-8 shows the *Examiner* building in 1937.

![Examiner building in 1937](source: Los Angeles Public Library)

**Figure 4.4-8. Exterior of the Examiner newspaper building at 1111 South Broadway in 1937. A Yellow Car can be seen at the bottom of the photo on Broadway.**

Source: Los Angeles Public Library
California Hospital represents one of the early hospitals in Los Angeles. First opened at 1414 South Hope in 1898, the hospital rapidly expanded into neighboring buildings to accommodate additional patients. In 1921, the Lutheran Hospital Society of Southern California purchased the hospital and would operate it for several decades. After the original hospital building proved inadequate by the 1920s, the Society built a nine-story hospital in 1926 at the original Hope Street location. The brick hospital would serve Los Angeles until it was severely damaged by the Northridge Earthquake of 1994. The building was demolished in 2000, although California Hospital continues to operate a hospital tower at 1401 South Grand Avenue, which was built in 1987.

The Streetcar in Los Angeles

Electric Streetcars and Interurbans (1885–1963)

While there had been talk of a street railway line in Los Angeles since the 1860s, it was not until the 1870s that there was the necessary economic boom and critical mass of population for its development. Judge Robert M. Widney incorporated the Spring & 6th Street Horse Railroad Co. in February of 1874 and brought the first car line into fruition in the downtown. In 1885, Los Angeles became one of only a handful of American cities with a cable car system thanks to the construction of the 2nd Street Cable Railroad, which ran west from Spring Street. The previous horse car lines simply could not operate on the steep grades that hemmed in downtown. Now neighborhoods with hilly terrain could be accessed by cable cars.

By the late 1880s, the cable car lines would lose patronage to the fledgling electric streetcars. During this period, electric streetcar technology, and specifically the electric motor, had been refined and successfully introduced in major East Coast cities. While cable cars continued to function in Los Angeles under the Pacific Railway Company, the line would face new competition from an emerging electric streetcar company named the Los Angeles Consolidated Electric Railway (LACE). Under the leadership of land developer Moses Sherman, LACE would rapidly expand throughout the downtown core. While the cable cars of Pacific Railway continued to maintain the largest ridership of the City’s streetcar lines in the early 1890s, its finances were precarious and its technology became increasingly antiquated. Pacific Railway struggled to remain solvent and was acquired by LACE by fall of 1893, bringing a precipitous end to horse and cable car lines previously run by Pacific Railway. With a virtual monopoly over streetcars in Los Angeles, LACE electrified all of its remaining horse and cable car lines by the summer of 1896, officially ushering in the era of the electric streetcar (Post 1989:101–111).

Even with near complete control of streetcar lines in Los Angeles, LACE would soon face financial difficulties of its own due in part to a national depression in the 1890s as well as mismanagement of the company. To avoid foreclosure, Moses Sherman relinquished control to company bondholders who formed a new railway corporation called the Los Angeles Railway Corporation (LARy), which would assume control of the electric streetcar system. By 1900, the yellow and brown cars of the Los Angeles Railway had extensive lines running throughout downtown Los Angeles and into neighborhoods such as Angelino Heights, East Los Angeles, and Boyle Heights. Real estate mogul and railroad baron Henry E. Huntington gained control of LARy, in 1898. In 1901, Huntington would also begin to assemble the expansive interurban Pacific Electric Red Cars system, which would span multiple counties in Southern California. The entirely separate LARy system would continue to be prevalent in the downtown core (Post 1989:105–109).
Through intermediaries, the Southern Pacific Railroad purchased an ever-increasing amount of the Pacific Electric Company’s stock as part of a quiet expansion effort into Southern California. By the 1910s, Huntington proceeded to further loosen his hold on his streetcar empire as he turned his attention to his public utility companies and pursued his passion for collecting rare books and art. In 1911, the Southern Pacific Railway forced Huntington out of Pacific Electric completely. The companies purchased by Southern Pacific would be combined under the Pacific Electric name. Huntington would still maintain control of the one streetcar system, the Los Angeles Railway, which would remain in the Huntington trust until 1945. This would leave only three streetcar companies operating in Los Angeles after 1911: the Pacific Electric, the Los Angeles Railway, and the small Glendale & Montrose Electric Railway, which consisted of only five cars and two lines operating largely in Glendale and La Canada (Walker 1977:45).

By the time of the 1911 merger, Pacific Electric Red Cars had become the largest interurban electric railway in the world in terms of miles of tracks (1,200 route miles) throughout Southern California. Nevertheless, Huntington’s Yellow Cars, which provided quick, local service in Los Angeles and operated 90 percent of its lines within the City limits, would become the true workhorse of the regional transit system. By 1924, LARy carried about twice as many passengers as the Pacific Electric, serving 255.6 million passengers compared to the Red Cars 100.9 million (Masters 2013).

Both the LARy Yellow Cars and Pacific Electric Red Cars reached the peak of their expansion and usage by the 1920s and 1930s, when they were commonly used to take people to popular shopping and entertainment districts in downtown Los Angeles from outlying suburbs that were not as well served by commercial retail. Despite the widespread use of both streetcar systems, the first indication of their decline began to appear as early as the 1920s. A vibrant automobile culture had entrenched itself in Southern California by the 1920s as car ownership rapidly grew from year to year and became increasingly affordable to a growing middle-class. Where the streetcars had previously been the only connection of outlying areas to central Los Angeles in the pre-automobile era, auto travel provided a desirable alternative and was supported by an expanding publicly funded road network. In the case of the Pacific Electric, real estate development had driven interurban expansion, and passenger operation was typically a loss leader. When most of the real estate holdings had been developed by the 1920s, this primary source of profit began to be depleted, and the least-used Pacific Electric car lines converted to buses as early as 1925 (Crump 1965:203–209). The real reason Southern Pacific Railway had been so keen to acquire the Pacific Electric routes was that far more profitable freight operation was possible compared to the Pacific Electric’s standard gauge long-distance tracks. The Los Angeles Railway, with its tight inner city curves and narrow gauge street operations, never carried more than a token amount of perishable freight. When the Great Depression came in 1930, the management of the Glendale & Montrose begged the Pacific Electric to buy out their operations. When the Pacific Electric refused, the Glendale & Montrose folded, and its tracks were sold to the Union Pacific Railway for freight operations only.

Both remaining rail transit companies experienced a boom in ridership during World War II due to gasoline, oil, and rubber rationing; too many forces were working against the sustainability of streetcars and interurbans. Due to high operational costs and anemic ridership, more and more of the underutilized lines to outlying communities were replaced by less costly bus lines during the 1930s and 1940s (Crump 1965:206–210). Figure 4.4-9 shows a retired Los Angeles Transit Lines streamliner in 1963.
Beyond the growing dominance of automobile culture, the streetcar's downfall in Los Angeles was further hastened by a reputation for aging infrastructure, frequent delays, and uncomfortable trains. At the same time, growing affluence during the post-World War II era allowed for an even greater expansion of automobile ownership. Public officials failed to integrate streetcar lines into proposed freeway projects, citing cost as the main impediment. A new government agency, the Los Angeles Metropolitan Transit Authority, took over the successors to the Yellow and Red Car systems in 1958 and soon dismantled the last vestiges of the old streetcar lines. The last former Pacific Electric interurban operated from downtown to Long Beach April 8, 1961, and the last five former Los Angeles Railway lines completed service in the early morning hours of April 1, 1963 (Masters 2013).

National Register Properties and Local Landmarks

The archaeological and tribal cultural resources study area was defined as the area circumscribed by the Project and an additional 0.25-mile buffer. The study area includes TPSS unit locations and MSF sites. A records search was conducted at the South Central Coastal Information Center in August 2012 in order to identify any archaeological resources that have been previously identified in the vicinity of the project area. A review of aerial maps indicates that the study area has been heavily altered by the construction and urbanization of downtown Los Angeles. A team of archaeologists drove the alignments and inspected the streets for any evidence of older curbs, pavers, or abandoned rail segments, which is standard procedure in this type of situation. Because the natural ground surface is not visible, a pedestrian archaeological field survey was not conducted. The records search included a review of all available archaeological resources reports and site records concerning properties directly bordering the entire alignment on both sides of the street. The South Central Coastal Information Center records search identified only one previously recorded...
archaeological site, 19-003129, in the study area. No new archaeological resources were recorded through the Project.

The historic resources study area was defined as the area as parcels adjacent to the alignment, including TPSS unit locations and MSF sites. In order to identify and evaluate historical resources, a multi-step methodology was utilized. Record searches for previous documentation of identified historic resources were conducted, including listings in the NRHP, determinations of eligibility for NRHP listings, the California Historical Resources Inventory database, and the City of Los Angeles's historic resource inventories. An intensive survey, including photography and background research, was then made of the study area. Additional background and site-specific research was conducted in order to evaluate the properties within their historic context. NRHP, CRHR, and City of Los Angeles criteria were employed to assess the significance of the properties.

*Historic property* means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the NRHP criteria [36 CFR 800.16(l)].

Details regarding the effort to identify and evaluate historic properties, and the parties contacted regarding historic properties are provided in Appendix E, the *Historic Properties Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles*. The records search included a review of all available archaeological and historical resources reports and site records concerning properties directly bordering the entire project route on both sides of the street. A total of 19 studies were previously conducted within portions of the study area. A total of 132 properties and one historic district have been previously recorded within the boundaries of the study area. Within the study area, nine buildings and one historic district are listed in the NRHP, 42 buildings and one historic district were previously determined eligible for the NRHP, and three buildings are only listed as HCMs. As previously stated, properties listed in or formally determined eligible for listing in the NRHP are automatically listed in the *California Register of Historic Resources* (CRHR).

Table 4.4-1 includes the name, address/location, map reference number, and status of historical resources included in the NRHP. Table 4.4-2 includes historical resources that have previously been determined eligible for the NHHP. Table 4.4-3 provides a list of additional historical resources declared by the City of Los Angeles to be HCMs that were not individually identified in Table 4.4-1 or Table 4.4-2. In addition to those mentioned above, ICF staff identified six more historical resources that appear eligible for listing in the NRHP. FTA requested concurrence with these determinations from the SHPO in a letter received on August 14, 2017. SHPO responded in a letter dated September 13, 2017. NRHP properties and local landmarks are shown in Figure 4.4-10.
### Table 4.4-1. Historical Resources Included in the NRHP

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/ Location</th>
<th>Map Reference #</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway Theatre and Commercial District Boundary increase</td>
<td>242–947 S. Broadway</td>
<td>7</td>
<td>Increased the boundary of the district and revised contributors/non-contributors.</td>
</tr>
<tr>
<td>Bradbury Building</td>
<td>300 S. Broadway</td>
<td>9</td>
<td>Listed as an NHL, and included on the NRHP under Criteria A and C, for architecture/engineering. Period of significance is 1893. This property was declared HCM #6.</td>
</tr>
<tr>
<td>Broadway Theatre and Commercial District</td>
<td>300–939 S. Broadway</td>
<td>7</td>
<td>Listed on the NRHP under Criteria A and C for architecture, commerce, and entertainment/recreation. Period of significance is 1894–1931. There are 60 contributing buildings, 38 non-contributing buildings, and three vacant lots within this district. This district was declared HCM #2306.</td>
</tr>
<tr>
<td>Million Dollar Theater/Edison Building</td>
<td>301 S. Broadway</td>
<td>8</td>
<td>Listed on the NRHP under Criteria A and C, for an event and architecture/engineering. Period of significance is 1916.</td>
</tr>
<tr>
<td>Friday Morning Club</td>
<td>940 S. Figueroa St.</td>
<td>50</td>
<td>Listed on the NRHP under Criterion C for associations with social/humanitarian activities, theater, and radio. Period of significance from 1923–1924. This property was declared HCM #196.</td>
</tr>
<tr>
<td>NY Cloak &amp; Suit House, Brockman Building</td>
<td>708 S. Grand Ave. &amp; 520 W. 7th St.</td>
<td>38</td>
<td>Listed on the NRHP under Criteria A and C, for community planning/development, architecture, and commerce. Period of significance from 1912–1925.</td>
</tr>
<tr>
<td>Angels Flight Railway/Angels Flight Railway Station House</td>
<td>S. Hill St., north of W. 4th St.</td>
<td>10</td>
<td>Listed on the NRHP under Criteria A and C, for an event and architecture/engineering. Period of significance is 1905—circa 1950. This property was declared HCM #4.</td>
</tr>
<tr>
<td>Subway Terminal Building, 417 Metro</td>
<td>417 S. Hill St.</td>
<td>13</td>
<td>Listed on the NRHP under Criteria A and C for transportation and architecture. Period of significance from 1925–1955. This property was declared HCM #177.</td>
</tr>
<tr>
<td>Title Guarantee and Trust Company Building</td>
<td>401–411 W. 5th St./425–457 S. Hill St.</td>
<td>15</td>
<td>Listed on the NRHP under Criterion C for architecture. Period of significance is 1930–1931. This property was declared HCM #278.</td>
</tr>
<tr>
<td>Roosevelt Building</td>
<td>727 W. 7th St.</td>
<td>26</td>
<td>Listed on the NRHP under Criteria A and C for architecture. Period of significance is 1926. This property was declared HCM #355.</td>
</tr>
<tr>
<td>Garfield Building</td>
<td>403 W. 8th St.</td>
<td>43</td>
<td>Listed on the NRHP under Criterion C for architecture/ engineering. Period of significance is 1929.</td>
</tr>
</tbody>
</table>


b There was no change in the net number of contributors. Six buildings originally considered to be contributing had their status changed to non-contributing, while six different buildings within the district were determined to be contributors. Two new non-contributing resources were identified within the district. Addresses identifying the current contributors and non-contributors to the historic district can be found in Appendix E. Accessed from http://www.NRHP.com/CA/Los+Angeles/state.html.

c See Table G-1 in Appendix E for a list of character-defining features of the district.
### Table 4.4-2. Historical Resources Previously Determined Eligible for the NRHP\(^a\)

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/Location</th>
<th>Map Reference #</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles Civic Center Historic District</td>
<td>Various addresses, downtown Los Angeles</td>
<td>1</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925–1972. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Barry’s</td>
<td>543–545 S. Broadway</td>
<td>20</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1901. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Clifton’s Cafeteria</td>
<td>648 S. Broadway</td>
<td>35</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1935. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Clifton’s Cafeteria Terrazzo Sidewalk</td>
<td>648 S. Broadway</td>
<td>34</td>
<td>Determined eligible for the NRHP under Criterion C for its high artistic qualities. Period of significance is 1935-1939. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Wurlitzer Building</td>
<td>818-820 S. Broadway</td>
<td>45</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1913–1923. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Burgers</td>
<td>828 S. Broadway</td>
<td>46</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1927. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Western Pacific Building</td>
<td>1023 S. Broadway</td>
<td>53</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1925.</td>
</tr>
<tr>
<td>LA Transit Building</td>
<td>1050–1070 S. Broadway</td>
<td>54</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1920.</td>
</tr>
<tr>
<td>Commercial Club, Hotel Case</td>
<td>1100 S. Broadway</td>
<td>56</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1925.</td>
</tr>
<tr>
<td>Examiner Building/ Herald Examiner</td>
<td>1111 S. Broadway</td>
<td>55</td>
<td>Determined eligible for the NRHP under Criteria B and C for a significant person and architecture. Period of significance is 1914. It is listed in the CRHR. This property was declared HCM #178.</td>
</tr>
<tr>
<td>Hotel Figueroa</td>
<td>939 S. Figueroa St.</td>
<td>51</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1925. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Blow-Up Boutique</td>
<td>947 S. Figueroa St.</td>
<td>52</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1939. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Dorothy Chandler Pavilion</td>
<td>135 N. Grand Ave.</td>
<td>2</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925–1971. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Disney Concert Hall</td>
<td>111 S. Grand Ave.</td>
<td>6</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 2003. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Name</td>
<td>Address/Location</td>
<td>Map Reference #</td>
<td>Status</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>------------------------</td>
<td>----------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Los Angeles County Courthouse/Stanley</td>
<td>111 N. Hill St.</td>
<td>3</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925–1971. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Mosk Los Angeles County Courthouse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Aldine, The Whipple, Myrick Hotel</td>
<td>324–326 S. Hill St.</td>
<td>11</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1893–1897. It is listed in the CRHR.</td>
</tr>
<tr>
<td>The Aldine, Myrick Hotel</td>
<td>342 S. Hill St.</td>
<td>12</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1897. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Clark Hotel &amp; Beauty School</td>
<td>426 S. Hill St.</td>
<td>14</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1912. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Pershing Square Building</td>
<td>448 S. Hill St.</td>
<td>16</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1923. It is listed in the CRHR.</td>
</tr>
<tr>
<td>William Fox Building</td>
<td>608 S. Hill St.</td>
<td>21</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1930.</td>
</tr>
<tr>
<td>Sun Reality, Banker’s Building</td>
<td>629 S. Hill St.</td>
<td>22</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1930.</td>
</tr>
<tr>
<td>Bullocks Downtown Department Store</td>
<td>632 S. Hill St.</td>
<td>23</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1906. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Los Angeles Fur Mart Building</td>
<td>635 S. Hill St.</td>
<td>24</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1925.</td>
</tr>
<tr>
<td>Great Western Savings Bank</td>
<td>700 S. Hill St.</td>
<td>42</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922.</td>
</tr>
<tr>
<td>Foreman &amp; Clark Building</td>
<td>701 S. Hill St.</td>
<td>41</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1928. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Union Bank and Trust Company</td>
<td>760 S. Hill St.</td>
<td>44</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1921. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Biltmore Hotel</td>
<td>515 S. Olive St.</td>
<td>17</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1923. It is listed in the CRHR. This property was declared HCM #60.</td>
</tr>
<tr>
<td>Bank of Italy/ A.P. Giannini Building</td>
<td>649 S. Olive St.</td>
<td>31</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922. This property was declared HCM #354.</td>
</tr>
<tr>
<td>Ville De Paris Store, La Merchandise</td>
<td>700–712 S. Olive St.</td>
<td>40</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1917.</td>
</tr>
<tr>
<td>Name</td>
<td>Address/Location</td>
<td>Map Reference #</td>
<td>Status</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>None</td>
<td>275 W. 1st St.</td>
<td>5</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1942. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Los Angeles County Law Library/Mildred L. Lillie Building</td>
<td>301 W. 1st St.</td>
<td>4</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925–1971. It is listed in the CRHR.</td>
</tr>
<tr>
<td>None</td>
<td>326 W. 5th St.</td>
<td>19</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1897. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Pantages/Warner Brothers Theatre</td>
<td>401 W. 7th St.</td>
<td>33</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1919.</td>
</tr>
<tr>
<td>LA Athletic Club</td>
<td>431 W. 7th St.</td>
<td>32</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1912. This property is also listed as HCM #69.</td>
</tr>
<tr>
<td>Coulter Dry Goods Co</td>
<td>500 W. 7th St.</td>
<td>39</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1917.</td>
</tr>
<tr>
<td>Brock &amp; Company Jewelry Store</td>
<td>513-515 W. 7th St.</td>
<td>30</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922. This property was declared HCM #358.</td>
</tr>
<tr>
<td>Brack Shops</td>
<td>527 W. 7th St.</td>
<td>29</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1913.</td>
</tr>
<tr>
<td>Quinby Building, Japan Airlines</td>
<td>529 W. 7th St.</td>
<td>28</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1926.</td>
</tr>
<tr>
<td>Boston Store, J. W. Robinson Company</td>
<td>600 W. 7th St.</td>
<td>37</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1914. It is listed in the CRHR. This property was declared HCM #357.</td>
</tr>
<tr>
<td>Union Oil Building, Kyowa Bank</td>
<td>617 W. 7th St.</td>
<td>27</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922.</td>
</tr>
<tr>
<td>Barker Bros.</td>
<td>800 W. 7th St.</td>
<td>36</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1925. It is listed in the CRHR. This property was declared HCM #135.</td>
</tr>
<tr>
<td>Fine Arts Building, Global Marine Building</td>
<td>807 W. 7th St.</td>
<td>25</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1926. It is listed in the CRHR. This property was declared HCM #125.</td>
</tr>
<tr>
<td>Insurance Exchange, Pacific Bell</td>
<td>855 S. Hill St.</td>
<td>47</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1924.</td>
</tr>
</tbody>
</table>


### Table 4.4-3. Additional Historical Resources Declared by the City of Los Angeles to Be Historic-Cultural Monuments

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/ Location</th>
<th>Map Reference #</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pershing Square, Spanish-American War Memorial</td>
<td>Northeast corner of W. 5th St. and S. Olive St.</td>
<td>18</td>
<td>Declared on 3/23/1980 as HCM #480</td>
</tr>
<tr>
<td>May Company Garage</td>
<td>9th and Hill Sts.</td>
<td>49</td>
<td>Declared on 6/1/2011 as HCM #1001</td>
</tr>
<tr>
<td>Original Pantry</td>
<td>809-817 W. 9th St. and 873-877 S. Figueroa St.</td>
<td>48</td>
<td>Declared on 10/5/1982 as HCM #255</td>
</tr>
</tbody>
</table>

**CONTRIBUTORS TO THE BROADWAY THEATRE AND COMMERCIAL HISTORIC DISTRICT**

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/ Location</th>
<th>Map Reference #</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irvine-Byrne Building</td>
<td>249 S. Broadway</td>
<td>7</td>
<td>Declared on 8/2/1991 as HCM #544</td>
</tr>
<tr>
<td>Judson Rives Building</td>
<td>424 S. Broadway</td>
<td>7</td>
<td>Declared on 7/17/2007 as HCM #881</td>
</tr>
<tr>
<td>Roxie Theater</td>
<td>512-525 S. Broadway</td>
<td>7</td>
<td>Declared on 3/20/1991 as HCM #526</td>
</tr>
<tr>
<td>Cameo Theater (formerly Clune’s Broadway)</td>
<td>526-530 S. Broadway</td>
<td>7</td>
<td>Declared on 3/20/1991 as HCM #524</td>
</tr>
<tr>
<td>Arcade Theater (formerly Pantages Theatre)</td>
<td>532-536 S. Broadway</td>
<td>7</td>
<td>Declared on 3/20/1991 as HCM #525</td>
</tr>
<tr>
<td>Los Angeles Theatre</td>
<td>615 S. Broadway</td>
<td>7</td>
<td>Declared on 8/15/1979 as HCM #225</td>
</tr>
<tr>
<td>Palace Theater</td>
<td>630 S. Broadway</td>
<td>7</td>
<td>Declared on 8/16/1989 as HCM #449</td>
</tr>
<tr>
<td>State Theater Building</td>
<td>701–713 S. Broadway and 300–314 W 7th St.</td>
<td>7</td>
<td>Declared on 3/20/1991 as HCM #522</td>
</tr>
<tr>
<td>Charles C. Chapman Building</td>
<td>756 S. Broadway</td>
<td>7</td>
<td>Declared on 12/5/2007 as HCM #899</td>
</tr>
<tr>
<td>Tower Theater</td>
<td>800 S. Broadway</td>
<td>7</td>
<td>Declared on 8/16/1989 as HCM #450</td>
</tr>
<tr>
<td>Hamburger’s Department Store (May Company-Downtown)</td>
<td>801-829 S. Broadway</td>
<td>7</td>
<td>Declared on 10/17/1989 as HCM #459</td>
</tr>
<tr>
<td>Rialto Theater (Marquee, Box Office and Original Marble Entry Floor)</td>
<td>812 S. Broadway</td>
<td>7</td>
<td>Declared on 12/20/1989 as HCM #472</td>
</tr>
<tr>
<td>Eastern Columbia Building</td>
<td>849 S. Broadway</td>
<td>7</td>
<td>Declared on 6/28/1985 as HCM #294</td>
</tr>
<tr>
<td>Blackstone’s Department Store</td>
<td>901 S. Broadway</td>
<td>7</td>
<td>Declared on 11/7/1991 as HCM #765</td>
</tr>
<tr>
<td>United Artists Theater Building</td>
<td>927-939 S. Broadway</td>
<td>7</td>
<td>Declared on 3/20/1991 as HCM #523</td>
</tr>
</tbody>
</table>

4.4.2 Environmental Consequences

This section expresses the operational methodology, evaluation, and impacts for archaeological, historical, and paleontological resources. Refer to Section 4.15, Construction, for an assessment of potential cultural resource effects associated with construction activities.

4.4.2.1 No Build Alternative

Not Adverse. Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.

Table 4.4-4. Historical Resources Eligible for the NRHP, Pending SHPO Concurrence

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/Location</th>
<th>Date Constructed</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Raid Siren Discontiguous District: Air Raid Sirens #00, and 011</td>
<td>West side of Hill St., south of 7th St.; south side of Olympic Blvd., west of Broadway</td>
<td>c. 1950</td>
<td>Determined eligible for the NRHP under Criterion A for its association with World War II Safety in Los Angeles as a contributor to a district. Period of significance is circa 1950.</td>
</tr>
<tr>
<td>W 7th Street District</td>
<td>W. 7th St. between S. Figueroa St. and S. Main St.</td>
<td>1903–1936</td>
<td>Determined eligible for the NRHP under Criteria A and C. Period of significance is 1903–1936.</td>
</tr>
<tr>
<td>Insurance Exchange Building Company</td>
<td>318 W. 9th St.</td>
<td>1924</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1924.</td>
</tr>
<tr>
<td>Original Pantry</td>
<td>809-817 W. 9th St. and 873-877 S. Figueroa St.</td>
<td>1917</td>
<td>Determined eligible for the NRHP under Criterion A for its association with downtown Los Angeles as an early diner still in existence. Period of significance is 1924.</td>
</tr>
</tbody>
</table>

Source: ICF International 2013.
Figure 4.4-10a. Index. National Register Properties and Local Landmarks Restoration of Historic Streetcar Service in Downtown Los Angeles
Figure 4.4-10b. Sheet 1 of 2. National Register Properties and Local Landmarks Restoration of Historic Streetcar Service in Downtown Los Angeles
Figure 4.4-10c. Sheet 2 of 2. National Register Properties and Local Landmarks Restoration of Historic Streetcar Service in Downtown Los Angeles
4.4.2.2 7th Street Alignment Alternative

Effect CUL-1: Archaeological and Tribal Cultural Resources

Not Adverse. Streetcar operations, including Platforms/Streetcar Stops, TPSS, and MSF sites, would not require earth moving activities except occasional disturbance of already disturbed areas for maintenance and replacement activities. There would be no potential for Project operations to disturb, damage, or degrade an archaeological resource or its setting. Therefore, the Project would not result in an adverse effect related to archaeological and tribal cultural resources.

Effect CUL-2: Historical and Architectural Resources

Not Adverse. The following section addresses the Project and its potential effects on historic properties. Each Project component was considered to determine if the undertaking would alter, directly or indirectly, any of the characteristics of a historic property that qualifies it for inclusion in the NRHP. For any properties within the APE that are listed in or are eligible for inclusion in the NRHP, the Section 106 Criteria of Adverse Effect were applied in accordance with 36 CFR 800.5.

Streetcar activities would not have an adverse effect on historic properties because there would be no demolition of a historic property, no relocation of a historic property, and no conversion, rehabilitation, or alteration of a historic property. Furthermore, there would be no operational activities that reduce the integrity or significance of important resources on the site or in the vicinity. Streetcars operated along the streets in the study area historically, and a system of poles and overhead wires existed for many decades, including during the period of significance for many of the NRHP-listed and -eligible properties previously identified or identified during the intensive survey. Overhead cables were part of the historic setting and their reintroduction would not be incongruous. The integrity of the setting or the character of the properties would not be altered in such a manner as to diminish the relationship of those properties to their historic setting. As discussed in Section 4.14, Visual Quality, OCS contact wires were not identified as a potentially adverse visual impact on the settings of any historic property.

Streetcar stops would be placed approximately every block in the north-south direction and approximately every other block in the east-west direction. The current plans include up to 24 platforms. The streetcars would make stops at 23 stations along the alignment, and the potential Grand Avenue Extension includes one additional station. Concrete sidewalks within the Broadway Theatre and Commercial District are not character-defining features; however, some terrazzo designs embedded in the sidewalks are character-defining features of the district. Other historic sidewalk features, including vault lights, basement vault hatch doors, flagpole holders, and utility and ventilation covers are also considered character-defining features of the Broadway Theatre and Commercial District. Individually significant historic properties may include these historic sidewalk features, along with brass or ceramic inserts that are unique to that resource. While the Project will not have an adverse effect on any historical resources, as construction of the Project progresses, an ongoing assessment of any unforeseen impacts to historic resources will be conducted to ensure historic resources in the immediate vicinity of the Project are protected against adverse impacts.

Design drawings will be made available during construction to contractors, identifying the locations of historic sidewalk features. Based on the most recent preliminary engineering plans (30% design, March 2017) sidewalks would not be damaged or demolished for the proposed project, however, the location of OCS poles is not yet known. Along the west side of Broadway, where the proposed alignment is located, terrazzo sidewalks extending the full width of the sidewalk from the building
face to the back of curb that are considered character-defining features of the Broadway Theater and Commercial District include those at 533, 601-605, and 609-613 South Broadway. Furthermore, conditions to protect the historic sidewalk features and preserve the material in place during construction will be required. Historic sidewalk features would be covered with a protective material to avoid scratches and staining from adjacent construction work. There are multiple options for choosing the placement of OCS poles to avoid damaging historic terrazzo sidewalks located within the Broadway District. For example, existing streetlight poles may be utilized to attach the catenaries or the OCS pole placement may be shifted so it is located in non-historic sidewalk areas. OCS poles have a maximum 120 foot spacing requirement, but they may be placed closer together to avoid damaging historic sidewalk material. Sidewalk ramps will be designed or located to avoid physical damage or alteration of historic sidewalk features. The existing concrete curb will not be removed at bump out areas in order to protect the historic sidewalk feature from being saw cut or from cracking. These measures will reduce the potential to alter or cause physical damage to the historic sidewalk features, and therefore ensure no substantial adverse change to the historic district or individually significant resources. Should incidental damage occur during construction occur, the historic sidewalk feature will be repaired or replaced in kind by a qualified contractor in a manner consistent with the Secretary’s Standards.

Once in operation, there is no potential for the Project to result in an adverse effect to an historic sidewalk. Refer to Section 4.15, Construction, for an assessment of potential construction effects.

TPSS units would not be located on historic properties. However, TPSS are proposed to be adjacent to the Friday Morning Club at 940 South Figueroa Street, Bullock’s Downtown Department Store at 632 South Hill Street, and the Subway Terminal Building at 417 South Hill Street. In addition, two TPSS units are proposed within the Broadway Theatre and Commercial Historic District. TPSS unit would not reduce the integrity or significance of important historic resources. TPSS units would be designed in a manner that is appropriate to the design context in which they are proposed. They would be given an architectural treatment that would be compatible with adjoining buildings. The two TPSS units proposed within the historic district would be located in parking lots or behind buildings that are not historic properties and, therefore, would not reduce the integrity or significance of the district.

The MSF site located at Broadway and 2nd Street would be located on a parking lot that currently has two commercial buildings that would be demolished for the proposed MSF. These two buildings are not historic properties. The MSF located at 11th Street and Olive Street (East) would be located on a parking lot that currently does not have structures. In addition, no historic properties are located adjacent to either MSF site. MSF operational activities would not impact an historical resource.

Using the above analysis, the criteria of adverse effect is applied to the undertaking’s potential effects on historic properties in the APE. As set forth in 36 CFR 800.5(a)(1), "an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative."
Examples of adverse effects are set forth in 36 CFR 800.5(a)(2) and an analysis of potential effects of the undertaking relevant to those examples is provided below.

(i) Physical destruction of or damage to all or part of the property;

Finding: Avoidance and Minimization CUL-C1 and measures to minimize vibration would avoid or minimize adverse effect resulting from physical destruction of or damage to all or part of a historic property.

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

Finding: No property listed in or determined eligible for listing in the NRHP would be subject to alterations that would be inconsistent with the Secretary’s Standards for the Treatment of Historic Properties. There is no intention to use former streetcar catenary wire anchor hooks on any of the buildings that are historic properties. All Project components would operate within the street right-of-way, on sidewalks, in vacant lots, or in non-historic parking garages. Avoidance and Minimization CUL-O1 would ensure consistency of repairs with the Secretary’s Standards. Also, reference CUL-C1 in Section 4.15, Construction.

(iii) Removal of the property from its historic location;

Finding: No property listed in or determined eligible for listing in the NRHP would be removed from their historic location as a result of the Project. All Project components would be constructed within the street right-of-way, on sidewalks, in vacant lots, or in non-historic parking garages. No removal of historic properties or contributing features of historic properties is expected, based on the Project description and construction memo.

(iv) Change in the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance;

Finding: No historic property would suffer a change in the character of its use and no physical features within a property’s setting that contribute to the historic significance of a property would be changed. All Project components would be operated within the street right-of-way, on sidewalks, in vacant lots, or in non-historic parking garages. No physical features, such as the contributing buildings and the terrazzo sidewalks in the Broadway Theatre and Commercial District, are subject to conversion in use.

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features;

Visual Elements

The significance of the Broadway Theatre and Commercial District is conveyed in part by the cohesive nature of the building setbacks, the materials used in the building façades, and the positioning of storefronts at street level. The significance of both the Downtown Hill Street Historic District and the West 7th Street Historic District is also conveyed by a cohesive grouping of buildings that demonstrate the growth of the City in the early decades of the twentieth century and display high style examples of popular architectural styles of the era. No setbacks would be changed, no building materials would be altered, and no storefronts would be changed.
Historically, streetcars operated along the streets in the APE, and a system of poles and overhead wires existed for many decades, including during the period of significance for many of the NRHP-listed and eligible properties previously identified or identified during the intensive survey. Overhead cables were part of the historic setting. The introduction of new overhead wires and poles would not visually diminish the cohesive nature of the districts, conveyed by architectural style, materials, setbacks, and storefronts, as overhead wires, poles, street lamps and traffic signals have been part of both the historic and current setting. Furthermore, a review of the Visual Impacts Assessment and the Noise and Vibration Technical Report was conducted and the results, as they relate to historic properties, are provided below.

As discussed in Section 4.14, Visual Quality, the Project would not result in adverse effects or cumulative adverse effects on visual resources, or on existing visual character and quality. Significant views of historic buildings would not be adversely affected by Project features, nor would Project features create substantial shade/shadow effects that have the potential to adversely affect shade/shadow sensitive viewers.

Although no visual impacts are anticipated, design and installation of any project-related facilities would have to conform to the HDLADG, Above Ground Facility Ordinance, and the BSMP. Design effects would be avoided and minimized by Avoidance and Minimization Measure AES-O3 for OCS poles and Avoidance and Minimization Measure CUL-O1 for all other project-related elements.

**Atmospheric or Audible Elements**

As discussed in Section 4.11, Noise and Vibration, the noise impact analysis was based on FTA guidance, which categorizes properties based on land use. The FTA guidance does not take into account whether a building is eligible for or listed in the NRHP, unless it is a National Historic Landmark with significant outdoor use (Category 1: Special Buildings; Theaters; and Concert Halls). The Bradbury Building, located at 304 South Broadway, is the only National Historic Landmark in the APE but it does not have significant outdoor use. No noise impact was identified at the Bradbury Building Refer to Section 4.4.2.2.1, Grand Avenue Extension Design Option, for a discussion of potential impacts to the Disney Concert Hall.

**Finding:** As described later in this report, Avoidance and Minimization AES-O1 will ensure that all TPSS structures would be designed to minimize their visual presence and Avoidance and Minimization AES-O3 will ensure that design and installation of the OCS poles will be consistent with the surrounding design context.

**(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or native Hawaiian organization;**

**Finding:** No property listed in or determined eligible for listing in the NRHP would be neglected as a result of the Project, in such a manner that would cause their deterioration. The Project would operate within the street right-of-way, and would not diminish access to historic properties, which should allow businesses in those historic properties to continue to operate. Businesses are expected to be accessible during construction, and no permanent obstruction to existing business is expected once the Project has been completed. Therefore, deterioration due to neglect and/or abandonment is not anticipated as a result of the Project.
(vii) **Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property’s historic significance.**

**Finding:** No property listed in or determined eligible for listing in the NRHP would be transferred, leased, or sold out of federal ownership or control as a result of the Project. There are no known historic properties within the APE owned by the federal government.

### 4.4.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would not affect the Project-related analysis presented above for archaeological and tribal cultural resources. Streetcar operations, including platforms/streetcar stops, TPSS units, and MSF operation, would not require earth moving activities except occasional disturbance of already disturbed areas for maintenance and replacement activities. There would be no potential for Project operations to disturb, damage, or degrade an archaeological resource or its setting. Therefore, the implementation of the Grand Avenue Extension Design Option would not result in an adverse effect related to archaeological and tribal cultural resources.

Implementation of the Grand Avenue Extension Design Option would affect one additional historic resource, which is the Disney Concert Hall. The Disney Concert Hall has been determined to be eligible for the NRHP. The Findings and examples of adverse effects are set forth in 36 CFR Section 800.5(a)(2) and an analysis of potential effects of the undertaking relevant to those examples discussed above are applicable to the Grand Avenue Extension Design Option except for noise. Section 4.11, Noise and Vibration, identifies a potential impact from audible noise. A moderate noise effect is predicted outside the Disney Concert Hall. Importantly, adverse noise effects were not identified within the Disney Concert Hall. The sources of streetcar noise impacts outside the Disney Concert Hall are the combination of: 1) wheel impacts at special trackwork and 2) potential squeal noise from tight curves located on Grand Avenue and 1st Street. The use of a “low impact” frog at the special trackwork would reduce the wheel impact noise. Use of one of several rail lubricants is usually sufficient to control wheel squeal. However, because of the steep grade of the track there is concern with the use of a lubricant at this location. The FTA Guidance Manual discusses wheel squeal from LRT vehicles and not from streetcars. It is less likely that wheel squeal would occur with a streetcar which is about 20 feet shorter than an LRT vehicle and 66-foot radii curves that are designed for the LA streetcar. The issue of wheel squeal, if it occurs at this location, would be addressed during pre-revenue operations. If it does occur the use of wheel dampers would control the wheel squeal without using a lubricant. This impact would be reduced to less than adverse by Mitigation Measure NV-01, presented in Section 4.11, Noise and Vibration, through installing a “low impact frog” at the 1st Street and Hill Street intersection and wheel dampers. The following Finding is in addition to the Finding listed above:

**Finding:** Mitigation Measure NV-01 would ensure that operational noise would not result in an adverse effect on the Disney Concert Hall.

### 4.4.3 Measures to Minimize Harm

**CUL-01:** The City of Los Angeles shall ensure that design and installation of all project facilities and elements that are adjacent to or abutting historical resources or within a historic district will be consistent with the surrounding design context. The appropriateness of the design will be achieved
through consultation with and approval by the City of Los Angeles Office of Historic Resources, applying the Secretary's Standards. Project facilities and elements shall be designed for consistency and installed to the satisfaction of the City Engineer and will be in compliance with the *Historic Downtown Los Angeles Design Guidelines* and the *Broadway Streetscape Master Plan*, as applicable. LABOE shall be the responsible party. LABOE shall consult on the design with the City of Los Angeles Office of Historic Resources. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

Also, refer to **NV-01** in Section 4.11, Noise and Vibration, **AES-01** and **AES-02** in Section 4.14, Visual Quality, and **CUL-C1** in Section 4.15, Construction.

### 4.5 Energy Resources

This section describes the potential for adverse effects related to energy. Refer to Section 3.4, Energy, of the Draft EIR for a detailed description of the affected environment that is summarized below.

#### 4.5.1 Affected Environment

Signed by President Obama in July 2012, the *Moving Ahead for Progress in the 21st Century Act* (MAP-21) represents the first multi-year transportation authorization enacted since 2005, funding surface transportation programs with more than $105 billion for fiscal years 2013 and 2014. Among the provisions within MAP-21 that relate to energy is the scope of the state and metropolitan planning organization (MPO) processes, which aim to “protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.” MAP-21 also authorized $70 million for a public transportation research program that focuses on energy efficiency and system capacity, among other items. With the exception of these provisions of MAP-21, there is no federal legislation related specifically to the subject of energy efficiency in public transportation project development and operation.

Mass transit projects, like streetcars, are relevant to addressing the energy needs in the state. As shown in Figure 4.5-1, nearly 38 percent of the energy consumed in California is for transportation purposes. The vast majority of this energy is from nonrenewable sources, with 96 percent of the state’s transportation needs being met by petroleum-based fuels (Cal/EPA 2007).

The effects of mass transit projects on energy supplies are traditionally assessed based on changes to travel modes and VMT. The Project-specific transportation analysis indicates that 115,000 daytime internal trips occur in the study area (all modes of transportation). This represents approximately 80 percent of study area trips. With respect to travel modes, automobile travel accounts for 60 percent of the trips (approximately 70,000 daily trips), while alternative modes (walk, transit, and bike) account for the remaining 40 percent. The average length of an internal trip is 0.7 mile. External trips, which begin or end outside of the study area, account for 20 percent of daily trips in the study area. Currently, much of this external travel is by automobile, with an average length for an external trip of 8.8 miles (Fehr and Peers 2013). In addition to study area automobile trips, downtown Los Angeles has the highest concentration of public transit services in the region, with 10 regional and local transit operators providing services.
With the exception of services offered by regional bus lines, transit operators in the study area provide service mainly during peak commute hours and in the peak direction. Metro, the study area’s largest transit provider, operates 50 bus lines in the area, with each line providing anywhere from five to more than 100 daily trips in each direction. Metro also operates the Red, Purple, Blue, and Expo rail lines within the study area. This information related to existing environment provides the information necessary to establish the baseline conditions for assessing changes in transportation-related energy use.

4.5.2 Environmental Consequences

4.5.2.1 No Build Alternative

Not Adverse. Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect. However, it is important to note that the No Build Alternative would not result in beneficial energy effects discussed below for the Project.

4.5.2.2 7th Street Alignment Alternative

Effect ENG-1: Direct Energy Consumption

Not Adverse. Direct energy consumption would result from fuel or electricity used to power the MSF or streetcar vehicles. Electricity would be provided through TPSS units. There would be several streetcar vehicles in service concurrently at any given time during operating hours. Six streetcar
vehicles would be in service only during commuting periods on weekdays (6:00 a.m.–9:00 a.m. and 3:00 p.m.–6:00 p.m.), with headways of approximately 7 minutes. Three or four vehicles would be in service during all other operating hours, with headways of 15 minutes and 10 minutes, respectively. Table 4.5-1 shows direct energy use. Streetcar operations would consume 10,666 million British thermal units (BTUs) per year, or approximately 205 million BTUs per week. Energy consumption associated with operation of the MSF would involve the use of electricity as well as fuel used by employee vehicles when traveling to and from the site. MSF operations would consume 3,458 million BTUs per year, or approximately 67 million BTUs per week. Energy use would total 14,124 million BTUs per year, or approximately 272 million BTUs per week (see Appendix G, Energy Calculations).

Although energy would be consumed during operation of the build alternatives, energy use would not be wasteful, inefficient, or unnecessary because facility operations would be conducted in adherence to applicable regulations (e.g., City’s Green Building Code). It would be consumed to provide a new transportation service and meet the project objectives. Furthermore, it is anticipated that the MSF sites would be illuminated with low-level lighting used for 24-hour operations, and transportation fuel use associated with the employees would result in a negligible difference in energy consumption.

Aside from complying with the general policies (e.g., City’s Green Building Code and Title 24, California Code of Regulations), there are no applicable quantitative operations-related energy conservation measures with which the Project would be required to comply. Moreover, as noted in the discussion of indirect impacts below, the VMT reduction due to the Project would result in energy savings, which would partially offset the increase in energy use associated with operation of the streetcar vehicles and the MSF. Therefore, the Project would not result in an adverse effect related to direct energy consumption.

Effect ENG-2: Indirect Energy Consumption

Beneficial. Indirect energy consumption would occur as a result of a project’s change to its environment. For example, the Project would encourage people to take transit instead of driving, thereby reducing VMT and associated fuel use in vehicles. The Project would displace trips that otherwise would have occurred with different modes of transportation. Although changes in energy consumption as a result of pedestrians, cyclists, and transit users taking the streetcar would be negligible, the Project would reduce the number of miles traveled by automobiles within and outside of the study area. The reduction in daily VMT is anticipated to be 6,327 vehicle-miles per day in the Opening Year (early 2021) and 7,731 in the Horizon Year (2040) (Metro 2017).

Table 4.5-1 shows indirect energy use associated with VMT reductions. Energy savings from VMT reduction would be 10,344 million BTUs per year in early 2021 and 8,362 million BTUs per year in 2040. The streetcar is a non-polluting, electric-powered vehicle that lessens reliance on fossil fuels. If the Project were in operation, an additional amount of annual energy usage would be required. However, this is considered a negligible increase in energy consumption that would not substantially impact the provision of generated electric power by the City or in the downtown area, as determined by LADWP. In addition, trips made on buses and cars in downtown Los Angeles that may be diverted to the streetcar would balance the additional electrical power required for streetcar operation. Therefore, the Project would result in a beneficial effect related to indirect energy consumption.
Table 4.5-1. Operational Energy Use

<table>
<thead>
<tr>
<th>Component</th>
<th>Fuel Quantity Used</th>
<th>Energy Use (MMBtu/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maintenance and Storage Facility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>LADWP generation mix</td>
<td>740</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>342,220 scf/yr natural gas</td>
<td>339</td>
</tr>
<tr>
<td>Worker Commuting</td>
<td>19,737 gal/yr gasoline</td>
<td>2,379</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td>3,458</td>
</tr>
<tr>
<td><strong>Streetcar Operation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>LADWP generation mix</td>
<td>10,666&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Subtotal MSF +Streetcar Operations</strong></td>
<td></td>
<td>14,124</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Savings from VMT Reduction (MMBtu/yr)&lt;sup&gt;b&lt;/sup&gt;</th>
<th>2015</th>
<th>2020&lt;sup&gt;c&lt;/sup&gt;</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>(11,309)</td>
<td>(10,344)</td>
<td>(8,362)</td>
</tr>
<tr>
<td>Project with Grand Avenue Extension</td>
<td>(14,101)</td>
<td>(12,961)</td>
<td>(10,634)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Net Energy Usage During Operation (Sum of all Components) MMBtu/yr</th>
<th>2015</th>
<th>2020&lt;sup&gt;c&lt;/sup&gt;</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>2,207</td>
<td>3,172</td>
<td>5,154</td>
</tr>
<tr>
<td>Project with Grand Avenue Extension</td>
<td>23</td>
<td>1,163</td>
<td>3,490</td>
</tr>
</tbody>
</table>


<sup>a</sup> Streetcar energy consumption estimate under the Project is 5.7% lower without the Grand Avenue Extension due to shorter facility length.

<sup>b</sup> Negative number indicates energy use reduction due to VMT reduction.

<sup>c</sup> The VMT analysis was prepared assuming streetcar operations would begin in late 2020. It has been determined that operations would now begin six months later than previously assumed for the Project resulting in a 2021 opening date. Nevertheless, the ridership forecast considered both ridership and VMT reductions through the year 2040, and indicated that both ridership and VMT reductions would increase throughout that period. A six-month delay in the opening date does not substantially alter this analysis. In addition, it is not anticipated that energy-related emissions would be significantly change in the six-month period.

**Effect ENG-3: Regional Energy Supply and Demand**

**Not Adverse.** Operations would result in a new user (i.e., the streetcar system) drawing energy from the power grid and a net increase in electricity consumption within the study area. Table 4.5-1 shows that total direct energy use and indirect energy savings. The Project would result in 3,172 million BTUs per year of energy use in early 2021 and 5,154 million BTUs per year of energy use in 2040.
The LADWP 2015 Power Integrated Resource Plan (LADWP 2015) projected future demand increases for electricity in its service area of less than 1 percent per year from 2015 until 2032 (after energy efficiency and distributed generation efforts are accounted for, the load growth is expected to amount to 0.8 percent per year). The Power Integrated Resource Plan, which accounts for future development in its forecasts, would not require new or expanded sources of energy or infrastructure to meet the energy demands of operation of the Project. Furthermore, LADWP has confirmed that the "project is part of the total load growth forecast for the City and has been taken into account in the planned growth of the City’s power system" (Garrity pers. comm.). Operation would result in a negligible increase in overall demand for electricity within the LADWP service area.

Energy distribution infrastructure (e.g., TPSS, poles, overhead wires) would be required to operate the streetcars, but would be constructed as a part of the Project and would be located along the Project alignment. No new offsite energy supply facilities or infrastructure would be required and project operation would not affect the reliability of the existing electrical grid. Therefore, the Project would not result in an adverse effect related to regional energy supply and demand.

4.5.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would further reduce energy consumption beyond the reductions estimated for the Project. The additional alignment would increase ridership by 1,679 riders in early 2021 and 2,390 riders in 2040. This would result in an additional VMT reduction of 1,404 miles per day in early 2021 and 1,862 miles per day in 2040. As shown in Table 4.5-1, above, there would be a reduction in mobile-source emissions with the Grand Avenue Extension. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would result in a beneficial effect related to energy consumption and would not result in an adverse effect related to direct energy use or regional energy supply and demand.

4.5.3 Measures to Minimize Harm

Operational effects related to energy use would not be adverse. No measures to minimize harm are required.

4.6 Environmental Justice

This section addresses the potential for the Project to result in impacts on environmental justice populations.

4.6.1 Affected Environment

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires federal agencies to seek environmental justice by "identifying and addressing social and economic effects of ... programs, policies, and activities on minority populations and low-income populations in the United States". In response to Executive Order 12898, U.S. Department of Transportation (LADOT) issued Order to Address Environmental Justice in Minority Populations and Low-Income Populations (LADOT Order 5610.2), which established the procedures...
to use in order to comply with Executive Order 12898 in order to avoid disproportionately high and adverse effects on minority and low-income populations.

In August 2012, the FTA made available guidance on environmental justice (EJ) in the form of a Circular (EJ Circular), Environmental Justice Policy Guidance for Federal Transit Administration Recipients. The EJ Circular provides recommendations to State Departments of Transportation, Metropolitan Planning Organizations, public transportation providers, and other recipients of FTA funds on how to fully engage environmental justice populations in the decision-making process, and how to analyze or determine whether environmental justice populations would be subjected to disproportionately high and adverse human health or environmental effects as a result of a transportation project.

Title VI of the Civil Rights Act of 1964 and related statutes require federally assisted programs not to discriminate on the basis of race, color, national origin, age, sex, or disability (religion is a protected category under the Fair Housing Act of 1968). Because much of the information needed to assess possible discrimination during project development is obtained during the study of potential community impacts, Title VI issues can logically be evaluated and covered in the section of environmental documents dealing with the social or human environment.

The Project site is located within downtown Los Angeles in the City of Los Angeles, within the County of Los Angeles. The study area includes the area covered by the Central City Community Plan, which is bounded by Cesar Chavez Avenue on the north, I-110 on the west, I-10 on the south, and Alameda Street on the east. Generally, the area immediately adjacent and surrounding the Project alignment includes both commercial and residential uses, including multi-family residential areas and single-resident occupancy (SRO) hotels in the Central City East area; high-rise condos and apartments in the South Park neighborhood; multi-family residential areas are located in Bunker Hill. Public facilities are primarily clustered in the northern part of the study area in the Civic Center and in the southern area surrounding the Convention Center. The largest open spaces in the study area are Grand Park in the Civic Center, Pershing Square in the Financial District, and Spring Street Park. For purposes of the EJ analysis, the “study area” includes the area immediately adjacent and surrounding the Project alignment, which are identified by Census Tract 2062, 2063, 2073.01, 2073.02, 2074, 2075.01, 2075.02 2077.10, 2079, 2240.10, and 2260.02.

Based on the U.S. Census Bureau American Community Survey 2015 data, and as shown in detail in Table 4.6-1, the total population of the County of Los Angeles was approximately 10,038,388 persons comprising of approximately 27 percent White, 48 percent Hispanic or Latino, 8 percent Black, 14 percent Asian, and 2 percent as Two or More Races. Less than one percent identifies as Native American, Native Hawaiian/Pacific Islander, or Other. The City has a total population of approximately 3,900,794 people of which approximately 28 percent identifies as White, 49 percent Hispanic or Latino, 9 percent Black, 11 percent Asian, and 2 percent as Two or More Races. Less than one percent identifies as Native American, Native Hawaiian/Pacific Islander, or Other.

The study area has a total population of approximately 34,894 people of which approximately 30 percent identifies as White, 23 percent Hispanic or Latino, 20 percent Black, 23 percent Asian, and 3 percent as Two or More Races. Less than one percent of the residents residing in the study area identify as Native American, Native Hawaiian/Pacific Islander, or Other. Based on the data and as shown therein, several census tracts have a high minority population. Specifically, Census Tracts 2074, 2240.10 and 2260.02 have a Hispanic or Latino population greater than 50 percent of the areas' population while Census Tract 2063 has a Black population greater than 50 percent.
Table 4.6-1. Race/Ethnicity in the Study Area and Region (ACS 2015 5-Year Estimates)

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Population</th>
<th>White (Not Hispanic or Latino)</th>
<th>White (Not Hispanic or Latino) (%)</th>
<th>Hispanic or Latino (of any race)</th>
<th>Hispanic or Latino (of any race) (%)</th>
<th>Black</th>
<th>Black (%)</th>
<th>Asian</th>
<th>Asian (%)</th>
<th>Native American</th>
<th>Native American (%)</th>
<th>Native Hawaiian/Pacific Islander</th>
<th>Native Hawaiian/Pacific Islander (%)</th>
<th>Other Race</th>
<th>Other Race (%)</th>
<th>Two or More Races</th>
<th>Two or More Races (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>County of Los Angeles</td>
<td>10,038,388</td>
<td>2,703,547</td>
<td>26.9</td>
<td>4,842,319</td>
<td>48.2</td>
<td>801,739</td>
<td>8.0</td>
<td>1,401,289</td>
<td>14.0</td>
<td>18,726</td>
<td>0.2</td>
<td>24,657</td>
<td>0.2</td>
<td>27,178</td>
<td>0.3</td>
<td>218,933</td>
<td></td>
</tr>
<tr>
<td>City of Los Angeles</td>
<td>3,900,794</td>
<td>1,107,571</td>
<td>28.4</td>
<td>1,898,577</td>
<td>48.7</td>
<td>341,357</td>
<td>8.8</td>
<td>445,738</td>
<td>11.4</td>
<td>623</td>
<td>0.2</td>
<td>6150</td>
<td>0.2</td>
<td>12,340</td>
<td>0.3</td>
<td>82,838</td>
<td></td>
</tr>
<tr>
<td>Study Area&lt;sup&gt;a&lt;/sup&gt;</td>
<td>34,894</td>
<td>10,370</td>
<td>29.7</td>
<td>7,964</td>
<td>22.8</td>
<td>6,900</td>
<td>19.8</td>
<td>8,079</td>
<td>23.2</td>
<td>112</td>
<td>0.3</td>
<td>27</td>
<td>0.1</td>
<td>256</td>
<td>0.7</td>
<td>1,186</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2062</td>
<td>3,294</td>
<td>406</td>
<td>12.3</td>
<td>786</td>
<td>23.9</td>
<td>626</td>
<td>19.0</td>
<td>1,373</td>
<td>41.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2063</td>
<td>5,514</td>
<td>1,191</td>
<td>21.6</td>
<td>1,132</td>
<td>20.5</td>
<td>2,839</td>
<td>100</td>
<td>18</td>
<td>1.8</td>
<td>59</td>
<td>1.1</td>
<td>27</td>
<td>0.5</td>
<td>35</td>
<td>0.6</td>
<td>176</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2073.01</td>
<td>4,686</td>
<td>2,123</td>
<td>45.3</td>
<td>889</td>
<td>19.0</td>
<td>834</td>
<td>17.8</td>
<td>631</td>
<td>13.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>208</td>
<td>4.4</td>
<td>174</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2073.02</td>
<td>4,243</td>
<td>1,741</td>
<td>41</td>
<td>630</td>
<td>14.8</td>
<td>946</td>
<td>22.3</td>
<td>422</td>
<td>9.9</td>
<td>37</td>
<td>0.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>259</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2074</td>
<td>991</td>
<td>143</td>
<td>14.4</td>
<td>607</td>
<td>61.3</td>
<td>168</td>
<td>17.0</td>
<td>45</td>
<td>4.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2075.01</td>
<td>2,128</td>
<td>822</td>
<td>38.6</td>
<td>236</td>
<td>11.1</td>
<td>7</td>
<td>0.3</td>
<td>1,011</td>
<td>47.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2075.02</td>
<td>2,504</td>
<td>573</td>
<td>22.9</td>
<td>179</td>
<td>7.1</td>
<td>84</td>
<td>3.4</td>
<td>1,485</td>
<td>59.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2077.10</td>
<td>3,197</td>
<td>1,488</td>
<td>46.5</td>
<td>550</td>
<td>17.2</td>
<td>214</td>
<td>6.7</td>
<td>922</td>
<td>28.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2079</td>
<td>4,627</td>
<td>1,227</td>
<td>26.5</td>
<td>887</td>
<td>19.2</td>
<td>572</td>
<td>12.4</td>
<td>1,816</td>
<td>39.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2240.10</td>
<td>2,112</td>
<td>270</td>
<td>12.8</td>
<td>1,216</td>
<td>57.6</td>
<td>419</td>
<td>19.8</td>
<td>182</td>
<td>8.6</td>
<td>8</td>
<td>0.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Census Tract 2260.02</td>
<td>1,598</td>
<td>386</td>
<td>24.2</td>
<td>852</td>
<td>53.3</td>
<td>201</td>
<td>12.6</td>
<td>92</td>
<td>5.8</td>
<td>8</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>The study area consists of 11 census tracts that compose downtown Los Angeles.
Asians make up a large portion of the population in Census Tracts 2062, 2075.01, 2075.02, and 2079. The demographic pattern of the study area has a lower minority concentration in the immediate surroundings of the Project, with higher minority concentrations along the perimeter of the study area. These areas with high minority populations are generally within the Little Tokyo, Civic Center, Central City East, Bunker Hill, South Park, and South Markets districts of Downtown.

Table 4.6-2 details the median household incomes and poverty levels for the county, city, and study area. The study area has a sizable low-income population, with approximately 42 percent living below the poverty threshold. For comparison, the county has a poverty rate of approximately 16 percent and the City has a poverty rate of approximately 22 percent.

Table 4.6-2. Income and Poverty Status in the Study Area and Region (2015)

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Population</th>
<th>Median Household Income</th>
<th>Population for Whom Poverty Status is Determined</th>
<th>Below Poverty Threshold</th>
<th>Percentage Below Poverty Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles County</td>
<td>10,038,388</td>
<td>$56,196</td>
<td>9,633,080</td>
<td>1,566,066</td>
<td>16.3%</td>
</tr>
<tr>
<td>City of Los Angeles</td>
<td>3,900,794</td>
<td>$50,205</td>
<td>3,831,666</td>
<td>847,382</td>
<td>22.1%</td>
</tr>
<tr>
<td>Study Area*</td>
<td>33,296</td>
<td>$32,646</td>
<td>33,643</td>
<td>12,913</td>
<td>41.6%</td>
</tr>
<tr>
<td>Census Tract 2062</td>
<td>3,294</td>
<td>$17,750</td>
<td>3,285</td>
<td>1,486</td>
<td>45.2%</td>
</tr>
<tr>
<td>Census Tract 2063</td>
<td>5,514</td>
<td>$10,484</td>
<td>5,264</td>
<td>4,247</td>
<td>80.7%</td>
</tr>
<tr>
<td>Census Tract 2073.01</td>
<td>4,686</td>
<td>$31,864</td>
<td>4,686</td>
<td>1,517</td>
<td>32.4%</td>
</tr>
<tr>
<td>Census Tract 2073.02</td>
<td>4,243</td>
<td>$38,438</td>
<td>4,239</td>
<td>760</td>
<td>17.9%</td>
</tr>
<tr>
<td>Census Tract 2074</td>
<td>991</td>
<td>$10,598</td>
<td>49</td>
<td>45</td>
<td>91.8%</td>
</tr>
<tr>
<td>Census Tract 2075.01</td>
<td>2,128</td>
<td>$63,598</td>
<td>2,128</td>
<td>264</td>
<td>12.4%</td>
</tr>
<tr>
<td>Census Tract 2075.02</td>
<td>2,504</td>
<td>$14,639</td>
<td>2,504</td>
<td>937</td>
<td>37.4%</td>
</tr>
<tr>
<td>Census Tract 2077.10</td>
<td>3,197</td>
<td>$57,801</td>
<td>3,184</td>
<td>875</td>
<td>27.5%</td>
</tr>
<tr>
<td>Census Tract 2079</td>
<td>4,627</td>
<td>$69,077</td>
<td>4,627</td>
<td>1,165</td>
<td>25.2%</td>
</tr>
<tr>
<td>Census Tract 2240.10</td>
<td>2,112</td>
<td>$17,843</td>
<td>2,083</td>
<td>989</td>
<td>47.5%</td>
</tr>
<tr>
<td>Census Tract 2260.02</td>
<td>1,598</td>
<td>$27,017</td>
<td>1,594</td>
<td>628</td>
<td>39.4%</td>
</tr>
</tbody>
</table>


*The study area consists of 11 census tracts that compose downtown Los Angeles.

The 11 Census Tracts that make up the study area are highly variable in the percentage of their population living below the poverty threshold. The two Census Tracts with the highest percentage of people living below the poverty threshold (approximately 92 percent and 81 percent) are Census Tracts 2074 and 2063. These two Census Tracts also have high minority concentrations. Of the 12 census tracts within the study area, nine have poverty rates higher than that of the City and the County. The two Census Tracts with the lowest percentage of impoverished people (approximately 12 percent and 18 percent) are Census Tracts 2075.01 and 2073.02. The median income for the County is approximately $56,196 dollars, while the City’s is approximately $50,205 dollars, and the Study area’s is approximately $32,646 dollars. Eight Census Tracts within the study area have median incomes below that of the City and the County. The remaining three Census Tracts (2075.01, 2077.10, and 2079) have median household incomes that are higher than that of both the median
incomes for both the City and the County. Nonetheless, the majority of the Census Tracts within the study area have higher poverty levels and lower median household incomes than the County and City. For these reasons, it can be further assumed that EJ populations are present throughout the study area.

Table 4.6-3 describes the profiles of workers within the study area. Workers are divided into categories by race, income, and ethnicity. The total number of jobs in the study area in the year 2010 was approximately 270,375 jobs. In the year 2014, the total number of jobs was approximately 294,633, an increase of approximately 24,258 jobs over a five-year time period. Of the workers occupying those jobs approximately 70.3 percent were minorities in the year 2010. By the year 2014 the share of minorities occupying jobs was slightly lower, approximately 69.8 percent.

Table 4.6-3. Worker Profile in the Study Area

<table>
<thead>
<tr>
<th>Socioeconomic Factors</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total All Jobs</td>
<td>270,375</td>
<td>292,799</td>
<td>283,807</td>
<td>286,383</td>
<td>294,633</td>
</tr>
<tr>
<td>Jobs by Earning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$1,250 per month or less</td>
<td>36,239</td>
<td>36,080</td>
<td>32,359</td>
<td>32,803</td>
<td>35,779</td>
</tr>
<tr>
<td>$1,251 to $3,333 per month</td>
<td>61,721</td>
<td>61,967</td>
<td>62,088</td>
<td>61,812</td>
<td>63,922</td>
</tr>
<tr>
<td>More than $3,333 per month</td>
<td>172,415</td>
<td>194,752</td>
<td>198,360</td>
<td>190,767</td>
<td>194,932</td>
</tr>
<tr>
<td>Jobs by Worker Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Alone</td>
<td>171,926</td>
<td>184,008</td>
<td>177,135</td>
<td>180,003</td>
<td>186,243</td>
</tr>
<tr>
<td>Black or African American Alone</td>
<td>36,241</td>
<td>41,968</td>
<td>41,385</td>
<td>40,972</td>
<td>41,801</td>
</tr>
<tr>
<td>American Indian or Alaska Native Alone</td>
<td>3,084</td>
<td>3,355</td>
<td>3,241</td>
<td>3,216</td>
<td>3,279</td>
</tr>
<tr>
<td>Asian Alone</td>
<td>51,822</td>
<td>55,632</td>
<td>54,089</td>
<td>54,165</td>
<td>54,751</td>
</tr>
<tr>
<td>Native Hawaiian or Other Pacific Island</td>
<td>988</td>
<td>1,085</td>
<td>1,071</td>
<td>1,086</td>
<td>1,124</td>
</tr>
<tr>
<td>Alone</td>
<td>6,314</td>
<td>6,751</td>
<td>6,886</td>
<td>6,940</td>
<td>7,435</td>
</tr>
<tr>
<td>Two or More Race Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs by Worker Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>178,616</td>
<td>196,077</td>
<td>191,249</td>
<td>192,511</td>
<td>197,364</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>91,759</td>
<td>96,722</td>
<td>92,558</td>
<td>93,871</td>
<td>97,269</td>
</tr>
</tbody>
</table>


In regards to job earnings, in the year 2010 approximately 36,239 workers (13.4 percent) made less than $1,250 dollars per month. In the year 2014, approximately 35,779 workers (12.1 percent) made less than $1,250 dollars per month. Although the data shows a slight drop in the workers who would be considered minorities and who make less than $1,250 dollars a month, it is clear there are EJ populations within the study area.

Table 4.6-4 details the age composition of the population within the county, city and study area. As detailed therein, of the total population residing in the County, approximately 26 percent are minors (under the age of 18 years old), approximately 77 percent are age 18 years old and over and the elderly population (65 years and older) comprise approximately 12 percent.
Table 4.6-4. Minor and Elderly Population in the Study Area and Region (2015)

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Population</th>
<th>Under 18</th>
<th>%</th>
<th>18 and Over</th>
<th>%</th>
<th>65 and Over</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>County of Los Angeles</td>
<td>10,038,388</td>
<td>2,607,572</td>
<td>26.0%</td>
<td>7,716,214</td>
<td>76.9%</td>
<td>1,189,759</td>
<td>11.9%</td>
</tr>
<tr>
<td>City of Los Angeles</td>
<td>3,900,794</td>
<td>965,009</td>
<td>25.0%</td>
<td>3,050,202</td>
<td>78.2%</td>
<td>437,224</td>
<td>11.2%</td>
</tr>
<tr>
<td>Study Area*</td>
<td>34,894</td>
<td>2,578</td>
<td>7.4%</td>
<td>32,700</td>
<td>93.5%</td>
<td>5,137</td>
<td>13.1%</td>
</tr>
<tr>
<td>Census Tract 2062</td>
<td>3,294</td>
<td>228</td>
<td>6.9%</td>
<td>3,104</td>
<td>94.2%</td>
<td>829</td>
<td>25.2%</td>
</tr>
<tr>
<td>Census Tract 2063</td>
<td>5,514</td>
<td>142</td>
<td>2.6%</td>
<td>5,395</td>
<td>97.8%</td>
<td>640</td>
<td>11.6%</td>
</tr>
<tr>
<td>Census Tract 2073.01</td>
<td>4,686</td>
<td>127</td>
<td>2.7%</td>
<td>4,559</td>
<td>97.3%</td>
<td>626</td>
<td>13.4%</td>
</tr>
<tr>
<td>Census Tract 2073.02</td>
<td>4,243</td>
<td>211</td>
<td>5.0%</td>
<td>4,035</td>
<td>95.1%</td>
<td>144</td>
<td>3.4%</td>
</tr>
<tr>
<td>Census Tract 2074</td>
<td>991</td>
<td>33</td>
<td>3.3%</td>
<td>991</td>
<td>100%</td>
<td>68</td>
<td>6.9%</td>
</tr>
<tr>
<td>Census Tract 2075.01</td>
<td>2,128</td>
<td>119</td>
<td>5.6%</td>
<td>2,035</td>
<td>95.6%</td>
<td>381</td>
<td>17.9%</td>
</tr>
<tr>
<td>Census Tract 2075.02</td>
<td>2,504</td>
<td>39</td>
<td>1.6%</td>
<td>2,477</td>
<td>98.9%</td>
<td>1,282</td>
<td>51.2%</td>
</tr>
<tr>
<td>Census Tract 2077.10</td>
<td>3,197</td>
<td>244</td>
<td>7.6%</td>
<td>2,974</td>
<td>93%</td>
<td>413</td>
<td>12.9%</td>
</tr>
<tr>
<td>Census Tract 2079</td>
<td>4,627</td>
<td>845</td>
<td>18.3%</td>
<td>3,956</td>
<td>85.5%</td>
<td>377</td>
<td>8.1%</td>
</tr>
<tr>
<td>Census Tract 2240.10</td>
<td>2,112</td>
<td>346</td>
<td>16.4%</td>
<td>1,798</td>
<td>85.1%</td>
<td>320</td>
<td>15.2%</td>
</tr>
<tr>
<td>Census Tract 2260.02</td>
<td>1,598</td>
<td>244</td>
<td>15.3%</td>
<td>1,376</td>
<td>86.1%</td>
<td>57</td>
<td>3.6%</td>
</tr>
</tbody>
</table>


*The study area consists of 11 census tracts that compose downtown Los Angeles.

In the City, approximately 25 percent of the population are minors, approximately 78 percent are age 18 years old and over and approximately 11 percent are considered elderly. The age composition of both the city and county are largely similar. The study area has a relatively low population of minors, approximately 7 percent. People 18 and over represent the largest age demographic comprising approximately 94 percent of the population in the study area and the elderly comprise approximately 13 percent of the population.

Table 4.6-5 outlines housing and occupancy in the County, City, and study area. In the County, there are approximately 3,476,719 total housing units, of which approximately 94 percent are occupied. The City has approximately 1,436,543 total housing units with approximately 93 percent occupied and the study area has approximately 23,576 housing units, of which approximately 88 percent are occupied. Overall, the study area has the highest percentage of vacant units, approximately 12 percent of the total amount of units. The average persons per household is 2.87 in the County, 2.71 in the City, and 1.55 in the study area.

4.6.2 Environmental Consequences

4.6.2.1 No Build Alternative

Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect. However, it is important to note that the No Build Alternative would not result in beneficial air quality and transit effects discussed below for the Project.
### Table 4.6-5. Occupancy in the Study Area and Region (2015)

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Units</th>
<th>Occupied Units</th>
<th>Percentage of Occupied Units</th>
<th>Vacant Units</th>
<th>Percentage of Vacant Units</th>
<th>Persons Per Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>County of Los Angeles</td>
<td>3,476,718</td>
<td>3,263,069</td>
<td>93.9%</td>
<td>213,649</td>
<td>6.1%</td>
<td>2.87</td>
</tr>
<tr>
<td>City of Los Angeles</td>
<td>1,436,543</td>
<td>1,342,761</td>
<td>93%</td>
<td>93,782</td>
<td>6.5%</td>
<td>2.71</td>
</tr>
<tr>
<td>Study Area*</td>
<td>23,576</td>
<td>20,712</td>
<td>87.9%</td>
<td>2,864</td>
<td>12.1%</td>
<td>1.55</td>
</tr>
<tr>
<td>Census Tract 2062</td>
<td>2,107</td>
<td>1,949</td>
<td>92.5%</td>
<td>158</td>
<td>7.5%</td>
<td>1.51</td>
</tr>
<tr>
<td>Census Tract 2063</td>
<td>2,656</td>
<td>2,424</td>
<td>91.3%</td>
<td>232</td>
<td>8.7%</td>
<td>-</td>
</tr>
<tr>
<td>Census Tract 2073.01</td>
<td>3,904</td>
<td>3,441</td>
<td>88.1%</td>
<td>463</td>
<td>11.9%</td>
<td>1.63</td>
</tr>
<tr>
<td>Census Tract 2073.02</td>
<td>3,528</td>
<td>3,001</td>
<td>85.1%</td>
<td>527</td>
<td>14.9%</td>
<td>1.54</td>
</tr>
<tr>
<td>Census Tract 2074</td>
<td>35</td>
<td>35</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Census Tract 2075.01</td>
<td>1,520</td>
<td>1,385</td>
<td>91.1%</td>
<td>135</td>
<td>8.9%</td>
<td>1.52</td>
</tr>
<tr>
<td>Census Tract 2075.02</td>
<td>2,038</td>
<td>1,864</td>
<td>91.5%</td>
<td>174</td>
<td>8.5%</td>
<td>-</td>
</tr>
<tr>
<td>Census Tract 2077.10</td>
<td>2,569</td>
<td>2,153</td>
<td>83.8%</td>
<td>416</td>
<td>16.2%</td>
<td>1.79</td>
</tr>
<tr>
<td>Census Tract 2079</td>
<td>2,802</td>
<td>2,404</td>
<td>85.2%</td>
<td>416</td>
<td>14.8%</td>
<td>1.67</td>
</tr>
<tr>
<td>Census Tract 2240.10</td>
<td>1,316</td>
<td>1,155</td>
<td>87.8%</td>
<td>161</td>
<td>12.2%</td>
<td>-</td>
</tr>
<tr>
<td>Census Tract 2260.02</td>
<td>1,083</td>
<td>901</td>
<td>83.2%</td>
<td>182</td>
<td>16.8%</td>
<td>1.2</td>
</tr>
</tbody>
</table>


*The study area consists of 11 census tracts that compose downtown Los Angeles.

### 4.6.2.2 7th Street Alignment Alternative

#### Effect EJ-1: Air Quality

**Beneficial.** The Project would reduce daily VMT due primarily to diversion of private automobile trips to the transit system. As shown in Table 4.2-2 in Section 4.2, Air Quality, the Project would result in emission reductions for NAAQS and related pollutants. Therefore, substantial adverse or disproportionate effects on an EJ population regarding air quality would not occur. To the contrary, the emission reductions represent a beneficial effect to EJ populations.

#### Effect EJ-2: Noise and Vibration

**Not Adverse with Mitigation.** Section 4.11, Noise and Vibration, includes a detailed assessment of potential adverse effects. In accordance with FTA guidance, impacts were estimated based on exterior noise levels. None of the anticipated noise and vibration impacts expected to occur as a result of the Project identified as being minor or moderately adverse will impact EJ residences or businesses and services serving EJ communities. Therefore, the Project would not result in substantial adverse or disproportionate effects on EJ populations related to noise and vibration.

#### Effect EJ-3: Cultural Resources

**Not Adverse with Mitigation.** Several cultural and historic resources are located along and in proximity to the Project Alignment, which are also located in the EJ communities. As discussed in Section 4.4, Cultural Resources, the Project would not damage or destroy properties that are listed in or eligible for the NRHP, nor would any such properties be subject to alterations that would be inconsistent with the Secretary’s Standards for the Treatment of Historic Properties. Furthermore, Mitigation Measure CUL-O1 would ensure that the Project would be designed and conform to the...
HDLADG, Above Ground Facility Ordinance, and the BSMP. By returning the streetcar to the downtown Los Angeles area, the Project would restore a feature that was once part of the setting for the NRHP-listed and -eligible properties within the APE, which can be considered beneficial. The Project would not introduce any visual, atmospheric, or audible element that would diminish the integrity of a historic property’s significant historic features. Therefore, the Project would not result in substantial adverse or disproportionate effects on EJ populations related to cultural resources.

**Effect EJ-4: Hazardous Materials**

*Not Adverse.* Hazardous materials would be used in the routine maintenance of the streetcar vehicles at the proposed MSF site, neither of which are located in proximity to any known EJ populations. The use and storage of hazardous materials would comply with all applicable federal, State, and local regulations that would ensure risks related to the release of use of hazardous materials is reduced and minimized. Compliance with such regulations would minimize risks to the surrounding community, including EJ communities. Therefore, the Project would not result in substantial adverse or disproportionate effects on EJ populations related to hazardous materials.

**Effect EJ-5: Visual Quality**

*Not Adverse with Mitigation.* Visual quality would not be diminished with the Project, but instead the Project would likely improve visual quality through the implementation of consistent paving and streetscape furniture installations. Section 4.14, Visual Quality, includes a detailed assessment of visual resources, which determined that visual quality effects at key observation points (KOPs) would be negligible. Significant recognized scenic vistas are not present in the viewshed and Project features would not have the potential to obscure or block views of the primary visual resources within the viewshed. Accordingly, significant views of historic buildings would not be adversely affected by Project features, nor would Project features create substantial shade/shadow effects that would have the potential to affect shade/shadow sensitive viewers adversely with an EJ population. Visual quality effects would be throughout the Project Alignment and not focused only within EJ communities. Furthermore, conforming with the HDLADG, Above Ground Facility Ordinance, and the BSMP, and incorporating Mitigation Measures AES-O1 through AES-O3, effects to the visual quality would be further reduced. Therefore, the Project would not result in substantial adverse or disproportionate effects on EJ populations related to visual quality.

**Effect EJ-6: Transportation and Traffic**

*Not Adverse.* As discussed under Section 4.13, Transportation and Traffic, the Project would affect several intersections. However, recommendations were made in the traffic study to optimize operating time for the Project and to maximize efficiency for the roadway network that would reduce potential adverse effects. From an intensity perspective, the implementation of the Project would provide the same benefits to EJ populations as to other populations relating to providing increased transit mobility within the historic core of downtown, including increased access to services and jobs without the need for automobile travel and parking, while at the same time increasing non-automobile mobility within downtown for EJ populations coming from outside of the area where a mode shift between automobile and transit is necessary. With respect to non-motorized transportation, bicycle facilities and sidewalk improvements would not be created as part of the Project, but cyclists and pedestrians would be able to travel along the Project alignment following completion of construction. Locally, the Project would provide a transportation benefit to residents, workers, and visitors to the downtown area by connecting residential and employment
hubs, shopping districts, civic resources, cultural institutions, historic landmarks, entertainment venues, and transit services. Implementation of the Project would improve connectivity of the roadway network for all transportation users, including EJ community users, in particular those EJ communities who rely more heavily on transit. Transportation improvements would occur along the Project alignment and go through several communities, including EJ communities, providing the same transit opportunity to all such communities. Therefore, the Project would not result in substantial adverse or disproportionate effects on EJ populations related to transportation and traffic.

Effect EJ-7: Parking

Not Adverse. The Project would result in the loss of approximately 19 on-street parking spaces, a majority of which would occur along Hill Street, which borders the neighborhoods of Bunker Hill, South Park, and Center City that contain EJ populations. However, these on-street spaces are primarily used for businesses, including EJ business, and are not commonly used by residents in Downtown. The on-street parking is metered parking with a two-hour limit. Thus, the loss of on-street parking could affect the adjacent businesses. However, the Project would increase mobility, pedestrian access, and visibility to businesses and that would similarly benefit the community, including EJ populations. The proposed MSF locations would also eliminate existing parking lots used as hourly pay lots for visitors and dedicated residential lots. However, even such public hourly-pay lots are not located adjacent to and do not provide any particularized benefits to recognized EJ communities. In addition, existing available off-street parking in combination with the existing transit network and proposed improvements to transit resulting from the Project have been determined to be adequate to serve residents and businesses in the study area. Therefore, the Project would not result in substantial adverse or disproportionate effects on EJ populations related to parking.

Effect EJ-8: Economic and Fiscal

Not Adverse. The Project would not result in the physical relocation of existing residences or businesses that would result in potentially adverse effects to the economy and fiscal climate of the community, including EJ populations. The Project would not directly create new businesses in the community in the adjacent areas, but instead would contribute to downtown’s revitalization and redevelopment by providing infrastructure that would increase mobility, pedestrian access, and visibility to community businesses. Furthermore, the Project would not directly affect employment within the community nor increase rent or property values. Therefore, the Project would not result in substantial adverse or disproportionate effects on EJ populations related to economic and fiscal considerations.

Effect EJ-9: Beneficial Effects

Beneficial effect. The Project would increase mobility and accessibility for people who live and work in Downtown as well as visitors by providing a link between residential and employment hubs, shopping districts, civic resources, cultural institutions, historic landmarks, entertainment venues, and transit services. The Project would promote transit use and walking within Downtown while reducing the need to travel by automobile. It should be noted that EJ populations may heavily rely on transit, and, therefore, transit improvements as a result of this Project would be beneficial to these communities. In addition, Project improvements would also stimulate new development, business visitors, and additional job opportunities that can be realized by EJ populations as well as
transit-dependent populations (i.e., disabled, elderly, children, etc.) within and around the Project area. Therefore, the Project would benefit all the surrounding population including EJ and transit-dependent populations.

Conclusion

The potential adverse effects resulting from the Project would not be more severe or greater in magnitude on a minority or low-income population. The potential adverse effects identified could be avoided or minimized through the implementation and incorporation of various mitigation measures discussed above. As no evidence to suggest that the efficacy of these measures would differ with respect to different population groups, the net result would be the same for all population groups for these resource areas.

4.6.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would not directly affect adjacent EJ population as operation would affect the surrounding areas as a whole. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would not result in disproportionate effects to EJ communities.

4.6.3 Measures to Minimize Harm

Refer to Mitigation Measures CUL-O1 in Section 4.4, Cultural Resources, NV-O1 through NV-O3 in Section 4.11, Noise and Vibration, and AES-O1 through AES-O3 in Section 4.14, Visual Quality.

4.7 4(f) Resources

This section describes the potential for the project to result in a use of Section 4(f) properties. This section has been prepared in accordance with U.S.C., Title 49, Section 303 and FTA regulations for Section 4(f) compliance codified at 23 CFR Part 774.

4.7.1 Affected Environment

Section 4(f) of the Department of Transportation Act of 1966, codified at U.S.C., Title 49, Section 303, states that under United States government policy, “special effort should be made to preserve the natural beauty of the countryside and public park and recreational lands, wildlife and waterfowl refuges, and historic sites.”

If a federal transportation project would result in a use under Section 4(f) of public parks, recreational lands, wildlife and waterfowl refuges, or historic sites, the Secretary of the Department of Transportation cannot approve the project unless “special effort” is made to avoid the resource. If no prudent and feasible alternatives to the use of a Section 4(f) resource exist, an analysis aimed at determining the alternative with the least harm to Section 4(f) resources is required. To determine whether Section 4(f) protection applies to lands potentially affected by a federal transportation project, two prerequisites are considered: (1) the project must involve a resource that is protected under the provisions of Section 4(f), and (2) there must be a use of that resource.

As defined in CFR, Title 23, Section 774.17, resources subject to Section 4(f) consideration include publicly owned lands that are considered part of a public park; a recreational area of national, state,
or local significance; a wildlife or waterfowl refuge; or a historic site of national, state, or local significance, whether publicly or privately owned. As defined in 23 CFR 774.17, the use of a protected Section 4(f) resource occurs when any of the following conditions are met.

- Land is permanently incorporated into a transportation facility.
- There is a *temporary occupancy* of land that is adverse in terms of the preservationist purposes of Section 4(f). Temporary occupancy results when Section 4(f) property, in whole or part, is required for project construction-related activities, but the property is not permanently needed for the transportation facility.
- There is no permanent incorporation of land, but the proximity of a transportation facility results in impacts so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired (i.e., *constructive use*).

**Study Areas**

A study area, as described below, helps define which Section 4(f) properties need to be evaluated for the Project. Public parks and recreation areas, and cultural resources, each have their own study areas in this report because the evaluation of cultural resources—as defined in Section 106—requires a definition of an APE, which differs from the more inclusive study area selected for public parks and recreation areas.

**Public Parks and Recreation Areas**

The study area for public parks and recreation lands extends 1,000 feet on either side of the Project alignment. Generally, a 1,000-foot area around project improvements captures all parks and recreation areas that could be directly or indirectly affected by a project.

**Cultural Resources**

The study area for cultural resources is the APE developed for this Project in accordance with 36 CFR 800.4(a)(1). The APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties or archaeological sites, if any such properties exist, thereby including the considerations required for Section 4(f) analysis. The APE was preliminarily defined by the SHPO as those parcels adjacent to the Project corridor described in the definition of the Project and encompasses all components, including MSF options and TPSS sites. A records search was conducted to identify the previously recorded historic built environment, archaeological resources, and prehistoric resources within a 0.25-mile (1,320-foot) radius of the APE. Areas outside the APE have no potential for adverse effects on historic properties and, therefore, have no potential for use under Section 4(f).

**Description of Section 4(f) Properties**

This section describes Section 4(f) properties that were considered for evaluation. Properties subject to Section 4(f) consideration include historic resources listed or eligible for listing in the NRHP, whether privately or publicly owned, as well as publicly owned parks, recreation areas, and wildlife and waterfowl refuges. No wildlife or waterfowl refuges exist along the Project alignment. Public parks and recreation areas, as well as historic sites, subject to Section 4(f) protection are identified below.
Public Parks and Recreation Areas

Table 4.7-1 provides a list of the eight parks and recreation areas within the study area that have been considered for evaluation as potential Section 4(f) resources. Table 4.7-1 also provides an overview of each resource's location relative to the Project, ownership, features, attributes, and significance. The locations of these properties are depicted in Figure 4.7-1.

Historic Sites

Prior to conducting the Section 4(f) analysis, the process to identify and evaluate historic properties as required under Section 106 of the NHPA was initiated for the Project. As part of this effort, consultation with SHPO was required. The first step in the Section 106 consultation process was the establishment of the APE. The APE was forwarded by FTA to SHPO for concurrence in a letter on April 14, 2013.

In accordance with FTA regulations, Section 4(f) requirements are only applicable to significant historic sites. A resource is considered to be “significant” for purposes of Section 4(f) if it is on or eligible for the NRHP (or otherwise determined important by the FTA Administrator). With regard to Section 4(f), in the event a historic property has been identified within the APE that is potentially eligible for the NRHP, the property is evaluated for use.

Within the study area, nine buildings and one historic district are listed in the NRHP, 42 buildings and one historic district were previously determined eligible for the NRHP. Table 4.7-2 lists the nine NRHP-listed properties and one NRHP-listed district. Table 4.7-3 lists 42 properties and one historic district, which were previously determined eligible for the NRHP. Table 4.7-4 lists two properties, two objects, and two historic districts that were determined eligible for the NRHP as a result of this Project. One National Historic Landmark is located within the APE: the Bradbury Building, at 304 South Broadway, which was listed on May 5, 1977 (National Historic Landmarks 2013).

Forty-two properties and one historic district were previously determined eligible for the NRHP (Table 4.7-3).

In addition to those mentioned above, six more historical resources were identified that appear eligible for listing in the NRHP. FTA requested concurrence with these determinations from the SHPO in a letter received on August 14, 2017.
### Table 4.7-1. Potential Section 4(f) Properties—Public Parks and Recreation Areas

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Size</th>
<th>Distance from Project Alignment(^a) (feet)</th>
<th>Jurisdiction</th>
<th>Park Features</th>
<th>Section 4(f) Resource?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>City Hall Park</td>
<td>1.7 acres</td>
<td>830</td>
<td>City of Los Angeles Department of Recreation and Parks</td>
<td>Landscaped area for congregating.</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Grand Park</td>
<td>12 acres</td>
<td>500</td>
<td>Los Angeles Grand Avenue Authority, a County and City joint venture</td>
<td>Large landscaped lawns, fountain, and coffee shop.</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>2(^{nd}) Street Park</td>
<td>0.6 acre</td>
<td>420</td>
<td>Los Angeles Police Department</td>
<td>Landscaped lawn typically used as a dog park.</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Spring Street Park</td>
<td>0.7 acre</td>
<td>410</td>
<td>City of Los Angeles Department of Recreation and Parks/Friends of the Old Bank District Gardens</td>
<td>Landscaped lawn with walking paths, seating, a water feature, artwork, and children's play equipment.</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Spring Street Parklets (2)</td>
<td>~200 square feet each</td>
<td>360</td>
<td>City of Los Angeles Department of Recreation and Parks</td>
<td>Planters with landscaping, exercise equipment, seating, foosball.</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Pershing Square</td>
<td>5 acres</td>
<td>Adjacent</td>
<td>City of Los Angeles Department of Recreation and Parks</td>
<td>Open landscaped area, permanent art and water installation, stage for community events, seating.</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>Angel's Knoll</td>
<td>1 acre</td>
<td>Adjacent</td>
<td>Los Angeles Community Redevelopment Agency, a designated local authority</td>
<td>Landscaped hillside park adjacent to the Angel's Flight funicular with benches.</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>Grand Hope Park</td>
<td>2.5 acres</td>
<td>870</td>
<td>Grand Hope Park, Inc.</td>
<td>Located adjacent to the Fashion Institute of Design and Merchandising, the park has a large landscaped lawn, seating, and children's play equipment.</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: City of Los Angeles Planning Department, GIS Data 2016.
\(^a\)The distance is approximate based on current design.
Figure 4.7-1. Locations of Potential Section 4(f) Properties—Public Parks and Recreation Areas
### Table 4.7-2. Properties Listed in the NRHP

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/ Location</th>
<th>Map Reference #</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway Theatre and Commercial District Boundary increase</td>
<td>242–947 S. Broadway</td>
<td>7</td>
<td>Increased the boundary of the district and revised contributors/non-contributors.</td>
</tr>
<tr>
<td>Bradbury Building</td>
<td>300 S. Broadway</td>
<td>9</td>
<td>Listed as a National Historic Landmark, and included on the NRHP under Criteria A and C, for architecture/engineering. Period of significance is 1893. This property was declared HCM #6.</td>
</tr>
<tr>
<td>Broadway Theatre and Commercial District</td>
<td>300–939 S. Broadway</td>
<td>7</td>
<td>Listed on the NRHP under Criteria A and C for architecture, commerce, and entertainment/recreation. Period of significance is 1894–1931. There are 60 contributing buildings, 38 non-contributing buildings, and three vacant lots within this district. This district was declared HCM #2306.</td>
</tr>
<tr>
<td>Million Dollar Theater/Edison Building</td>
<td>301 S. Broadway</td>
<td>8</td>
<td>Listed on the NRHP under Criteria A and C, for an event and architecture/engineering. Period of significance is 1916.</td>
</tr>
<tr>
<td>Friday Morning Club</td>
<td>940 S. Figueroa St.</td>
<td>50</td>
<td>Listed on the NRHP under Criterion C for associations with social/humanitarian activities, theater, and radio. Period of significance from 1923–1924. This property was declared HCM #196.</td>
</tr>
<tr>
<td>NY Cloak &amp; Suit House, Brockman Building</td>
<td>708 S. Grand Ave. &amp; 520 W. 7th St.</td>
<td>38</td>
<td>Listed on the NRHP under Criteria A and C, for community planning/development, architecture, and commerce. Period of significance from 1912–1925.</td>
</tr>
<tr>
<td>Angels Flight Railway/Angels Flight Railway Station House</td>
<td>S. Hill St., north of W. 4th St.</td>
<td>10</td>
<td>Listed on the NRHP under Criteria A and C, for an event and architecture/engineering. Period of significance is 1905—circa 1950. This property was declared HCM #4.</td>
</tr>
<tr>
<td>Subway Terminal Building, 417 Metro</td>
<td>417 S. Hill St.</td>
<td>13</td>
<td>Listed on the NRHP under Criteria A and C for transportation and architecture. Period of significance from 1925–1955. This property was declared HCM #177.</td>
</tr>
<tr>
<td>Title Guarantee and Trust Company Building</td>
<td>401–411 W. 5th St./425–457 S. Hill St.</td>
<td>15</td>
<td>Listed on the NRHP under Criterion C for architecture. Period of significance is 1930–1931. This property was declared HCM #278.</td>
</tr>
<tr>
<td>Roosevelt Building</td>
<td>727 W. 7th St.</td>
<td>26</td>
<td>Listed on the NRHP under Criteria A and C for architecture. Period of significance is 1926. This property was declared HCM #355.</td>
</tr>
<tr>
<td>Garfield Building</td>
<td>403 W. 8th St.</td>
<td>43</td>
<td>Listed on the NRHP under Criterion C for architecture/engineering. Period of significance is 1929.</td>
</tr>
</tbody>
</table>


* Although the Broadway District is listed twice in Table 4.7-2, once for its original boundaries and once for the increase, it is only one historic property and therefore counted only once among properties previously listed in or determined eligible for the NRHP. There was no change in the net number of contributors. Six buildings originally considered to be contributing had their status changed to non-contributing, while six different buildings within the district were determined to be contributors. Two new non-contributing resources were identified within the district. Addresses identifying the current contributors and non-contributors to the historic district can be found in Appendix H. Accessed from http://www.NRHP.com/CA/Los+Angeles/state.html.

* See Table G-1 in Appendix E for a list of character-defining features of the district.
Table 4.7-3. Historical Resources Previously Determined Eligible for the NRHPa

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/Location</th>
<th>Map Reference #</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles Civic Center Historic District</td>
<td>Various addresses, downtown LA</td>
<td>1</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925-1972. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Barry’s</td>
<td>543-545 S. Broadway</td>
<td>20</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1901. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Clifton’s Cafeteria</td>
<td>648 S. Broadway</td>
<td>35</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1935. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Clifton’s Cafeteria Terrazzo Sidewalk</td>
<td>648 S. Broadway</td>
<td>34</td>
<td>Determined eligible for the NRHP under Criterion C for its high artistic qualities. Period of significance is 1935-1939. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Wurlitzer Building</td>
<td>818-820 S. Broadway</td>
<td>45</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1913-1923. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Burgers</td>
<td>828 S. Broadway</td>
<td>46</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1927. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Western Pacific Building</td>
<td>1023 S. Broadway</td>
<td>53</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1925.</td>
</tr>
<tr>
<td>LA Transit Building</td>
<td>1050–1070 S. Broadway</td>
<td>54</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1920.</td>
</tr>
<tr>
<td>Commercial Club, Hotel Case</td>
<td>1100 S. Broadway</td>
<td>56</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1925.</td>
</tr>
<tr>
<td>Examiner Building/Herald Examiner</td>
<td>1111 S. Broadway</td>
<td>55</td>
<td>Determined eligible for the NRHP under Criteria B and C for a significant person and architecture. Period of significance is 1914. It is listed in the CRHR. This property was declared HCM # 178.</td>
</tr>
<tr>
<td>Hotel Figueroa</td>
<td>939 S. Figueroa St.</td>
<td>51</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1925. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Blow-Up Boutique</td>
<td>947 S. Figueroa St.</td>
<td>52</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1939. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Dorothy Chandler Pavilion</td>
<td>135 N. Grand Ave.</td>
<td>2</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925–1971. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Disney Concert Hall</td>
<td>111 S. Grand Ave.</td>
<td>6</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 2003. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Los Angeles County Courthouse/Stanley Mosk</td>
<td>111 N. Hill St.</td>
<td>3</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925–1971. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Los Angeles County Courthouse</td>
<td>324–326 S. Hill St.</td>
<td>11</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1893–1897. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Name</td>
<td>Address/Location</td>
<td>Map Reference #</td>
<td>Status</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
<td>-----------------</td>
<td>--------</td>
</tr>
<tr>
<td>The Aldine, Myrick Hotel</td>
<td>342 S. Hill St.</td>
<td>12</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1897. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Clark Hotel &amp; Beauty School</td>
<td>426 S. Hill St.</td>
<td>14</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1912. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Pershing Square Building</td>
<td>448 S. Hill St.</td>
<td>16</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1923. It is listed in the CRHR.</td>
</tr>
<tr>
<td>William Fox Building</td>
<td>608 S. Hill St.</td>
<td>21</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1930.</td>
</tr>
<tr>
<td>Sun Reality, Banker’s Building</td>
<td>629 S. Hill St.</td>
<td>22</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1930.</td>
</tr>
<tr>
<td>Bullocks Downtown Department Store</td>
<td>632 S. Hill St.</td>
<td>23</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1906. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Los Angeles Fur Mart Building</td>
<td>635 S. Hill St.</td>
<td>24</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1925.</td>
</tr>
<tr>
<td>Great Western Savings Bank</td>
<td>700 S. Hill St.</td>
<td>42</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922.</td>
</tr>
<tr>
<td>Foreman &amp; Clark Building</td>
<td>701 S. Hill St.</td>
<td>41</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1928. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Union Bank and Trust Company</td>
<td>760 S. Hill St.</td>
<td>44</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1921. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Biltmore Hotel</td>
<td>515 S. Olive St.</td>
<td>17</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1923. It is listed in the CRHR. This property was declared HCM #60.</td>
</tr>
<tr>
<td>Bank of Italy/A.P. Giannini Building</td>
<td>649 S. Olive St.</td>
<td>31</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922. This property was declared HCM #354.</td>
</tr>
<tr>
<td>Ville De Paris Store, La Merchandise</td>
<td>700–712 S. Olive St.</td>
<td>40</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1917.</td>
</tr>
<tr>
<td>None</td>
<td>275 W. 1st St.</td>
<td>5</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1942. It is listed in the CRHR.</td>
</tr>
<tr>
<td>Los Angeles County Law Library/Mildred L. Lillie Building</td>
<td>301 W. 1st St.</td>
<td>4</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1925–1971. It is listed in the CRHR.</td>
</tr>
<tr>
<td>None</td>
<td>326 W. 5th St.</td>
<td>19</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1897. It is listed in the CRHR.</td>
</tr>
</tbody>
</table>
### Restoration of Historic Streetcar Service in Downtown Los Angeles

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/Location</th>
<th>Map Reference</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pantages/Warner Brothers Theatre</td>
<td>401 W. 7th St.</td>
<td>33</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1919.</td>
</tr>
<tr>
<td>LA Athletic Club</td>
<td>431 W. 7th St.</td>
<td>32</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1912. This property is also listed as HCM # 69.</td>
</tr>
<tr>
<td>Coulter Dry Goods Co</td>
<td>500 W. 7th St.</td>
<td>39</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1917.</td>
</tr>
<tr>
<td>Brock &amp; Company Jewelry Store</td>
<td>513-515 W. 7th St.</td>
<td>30</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922. This property was declared LAHCM # 358.</td>
</tr>
<tr>
<td>Brack Shops</td>
<td>527 W. 7th St.</td>
<td>29</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1913.</td>
</tr>
<tr>
<td>Quinby Building, Japan Airlines</td>
<td>529 W. 7th St.</td>
<td>28</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1926.</td>
</tr>
<tr>
<td>Boston Store, J. W. Robinson Company</td>
<td>600 W. 7th St.</td>
<td>37</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1914. It is listed in the CRHR. This property was declared HCM # 357.</td>
</tr>
<tr>
<td>Union Oil Building, Kyowa Bank</td>
<td>617 W. 7th St.</td>
<td>27</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1922.</td>
</tr>
<tr>
<td>Barker Bros.</td>
<td>800 W. 7th St.</td>
<td>36</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1925. It is listed in the CRHR. This property was declared HCM # 135.</td>
</tr>
<tr>
<td>Fine Arts Building, Global Marine Building</td>
<td>807 W. 7th St.</td>
<td>25</td>
<td>Determined eligible for the NRHP under Criteria A and C for association and architecture. Period of significance is 1926. It is listed in the CRHR. This property was declared HCM # 125.</td>
</tr>
<tr>
<td>Insurance Exchange, Pacific Bell</td>
<td>855 S. Hill St.</td>
<td>47</td>
<td>Determined eligible for the NRHP (Criterion N/A). Period of significance is 1924.</td>
</tr>
</tbody>
</table>

Table 4.7-4. Historical Resources Eligible for the NRHP, Pending SHPO Concurrence

<table>
<thead>
<tr>
<th>Name</th>
<th>Address/Location</th>
<th>Date Constructed</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Raid Siren Discontiguous District:</td>
<td>West side of Hill St., south of 7th St.; south side of Olympic Blvd., west of Broadway</td>
<td>c. 1950</td>
<td>Determined eligible for the NRHP under Criterion A for its association with World War II Safety in Los Angeles as a contributor to a district. Period of significance is circa 1950.</td>
</tr>
<tr>
<td>W. 7th Street District</td>
<td>W. 7th Street between S. Figueroa St and S. Main St.</td>
<td>1903–1936</td>
<td>Determined eligible for the NRHP under Criteria A and C. Period of significance is 1903–1936.</td>
</tr>
<tr>
<td>Insurance Exchange Building Company</td>
<td>318 W. 9th St.</td>
<td>1924</td>
<td>Determined eligible for the NRHP under Criterion C for architecture. Period of significance is 1924.</td>
</tr>
<tr>
<td>Original Pantry</td>
<td>809-817 W. 9th St. and 873-877 S. Figueroa St.</td>
<td>1917</td>
<td>Determined eligible for the NRHP under Criterion A for its association with downtown Los Angeles as an early diner still in existence. Period of significance is 1924.</td>
</tr>
</tbody>
</table>


The following properties have been determined ineligible for the NRHP as a result of this undertaking. SHPO concurrence is being requested for the determinations. None of these properties were determined eligible for the NRHP under Criteria A, B, C, and/or D; therefore, they are not protected under Section 4(f) and are not considered to be part of this analysis.

- 1020 South Figueroa Street
- 1100 South Flower Street
- 1100 South Grand Avenue
- South Hill Street: 208, 222, 332, 338-348, 606, 607, 628, 645, 734, 901, and 1101–1111
- 655 South Hope Street
- South Olive Street: 643, 1057, and 1060
- 316 West 2nd Street
- 315 West 6th Street
- West 7th Street: 219, 316, 410–418 (three parcels, one building; 410, 412, 418), and 801
- West 8th Street: 313 and 317
- 425 West 11th Street
- Spanish-American War Memorial
In addition to the historic structures identified above, archeological sites listed in the NRHP also come under the purview of Section 4(f). A records search and archaeological survey was completed to determine whether prehistoric resources are present along the Project alignment. There is no evidence of archaeological resources in the APE. The entire APE has been heavily altered by the construction and urbanization of downtown Los Angeles, and the natural ground surface is not visible. Because the natural ground surface is not visible, an archaeological field survey was not conducted. Section 4(f) applies to archeological sites that are on or eligible for the NRHP and that warrant preservation in place.

Section 4(f) does not apply to an archaeological site if it is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place (FHWA 2012). In the event an archeological site is discovered during construction, the requirements of Section 4(f) would apply. Therefore, there are no archeological sites protected by Section 4(f) for this Project.

4.7.2 Environmental Consequences

4.7.2.1 No Build Alternative

No Use. Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist in without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.

4.7.2.2 7th Street Alignment Alternative

A 4(f) analysis encompasses construction and operational effects of the Project. Unlike other sections of the EA where construction effects are discussed in Section 4.15, Construction, the 4(f) analysis in this section discusses construction and operational effects.

Effect 4(f)-1: Public Parks and Recreation Areas

No Use. As discussed below, the Project would not result in an adverse 4(f) effect related to public parks and recreation areas.

Direct Use. There are six public parks that qualify as Section 4(f) resources. However, the Project alternatives would not require any right-of-way to be acquired from any of the Section 4(f) properties listed in Table 4.7-1; therefore, there is no potential for a direct use of any Section 4(f) protected property.

Temporary Occupancy. No construction staging and/or construction easement, including TPSS and MSF sites, would be required from any of the identified Section 4(f) properties. Although construction activities associated with the Project are not minor in scope, they would not impair the activities, features, or attributes that qualify the public parks and recreation areas for protection under Section 4(f). Construction work would take place within the road right-of-way, thereby avoiding the need for any temporary occupancy of Section 4(f) protected land. Therefore, there would be no temporary occupancy of the Section 4(f) properties.
Constructive Use. In absence of any potential direct or temporary use of Section 4(f) property, the only potential for use of a Section 4(f) property would be due to proximity impacts (or constructive use) from the Project, resulting in impairment of protected activities, features, or attributes of a Section 4(f) resource. A screening threshold of 125 feet was used to assess the potential for constructive uses, which is the FTA noise and vibration screening distance for steel-wheeled vehicles. Of those resources listed in Table 4.7-1, the following four public park and recreational area resources are located far enough from and separated by intervening urban uses that no proximity impacts and, therefore, no constructive use would occur: City Hall Park, Grand Park, Spring Street Park, and Spring Street Parklet.

The potential for constructive use to Pershing Square and Angel’s Knoll was evaluated because these are the only resources within 125 feet.

The potential for constructive use is limited to the following occurrences:

- Project-attributable noise levels that interfere with use and enjoyment of a noise-sensitive Section 4(f) protected facility;
- Impairment of aesthetic features or attributes of a Section 4(f) property where such features are considered important contributing elements to the value of the property;
- Restricted access that diminishes the utility of a Section 4(f) resource; or
- Vibration impacts from construction or operation of the project that substantially impair use of a Section 4(f) resource.

Accordingly, the following discussion evaluates whether the Project has the potential to have any of the above-listed effects on the two resources located within 125 feet of the Project.

Project Attributable Noise Levels that Interfere with Use and Enjoyment of a Noise-Sensitive Section 4(f) Protected Facility. None of the identified recreational resources have facilities that are considered noise-sensitive, such as outdoor amphitheaters, sleeping areas, wildlife viewing areas, or significant attributes that require serenity and quiet.

According to the Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ATS Consulting 2017), the streetcar noise analysis is based on FTA guidance, which categorizes properties based on land use: Category 1 includes recording studios and concert halls; Category 2 includes residences, hotels, and hospitals where people sleep; and Category 3 includes institutional land uses such as schools, libraries, theaters, and churches. The FTA defines a park as noise sensitive if it is used for passive recreation like reading, conversation, meditation, etc. If it is used for active recreation it is not considered noise sensitive; this includes parks used for outdoor concerts and performances. Grand Park and Pershing Square are both used for outdoor performances and concerts, and play areas, which are considered an active recreation use. Therefore, these parks are not considered to be a noise sensitive resource.

Additionally, these recreational resources are located in an urban setting close to Hill and Olive Streets, which are busy arterials with existing bus operations. With mitigation, noise impacts resulting from the Project are not expected to be adverse. Accordingly, there is no anticipated potential for noise-related impacts on use and enjoyment of these recreational resources.

Impairment of Aesthetic Features or Attributes of a Section 4(f) Property Where Such Features Are Considered Important Contributing Elements to the Value of the Property. The existing visual environment at each of the two resources is dominated by the urban character of the surroundings and the existing streetscape. Beyond constructing streetcar platforms, TPSSs, and MSF sites, the
Project would not substantially alter the visual landscape and would have little to no effect on the visual character and value of the recreational resources located within 125 feet of the Project. Nonetheless, the following Project design features are recommended to ensure that Project design components are built with sensitivity to the visual environment.

**Design of Traction Power Substation (TPSS) Structures.** All TPSS structures shall be designed to minimize their presence in visual terms. Where site and design allow, design and location features shall be incorporated, such as the minimization of the size of the structures, setbacks from adjoining street frontages, screening, and/or architectural treatment that is appropriate to its design setting where visible from the public right-of-way at street level. Should a TPSS be located within the public right-of-way, it shall be designed in conformance with the “Los Angeles Above-Ground Facility” regulations contained in Section 62.08 of the LAMC.

**Maintenance Storage Facility (MSF) Design.** The MSF building treatments and architecture shall be appropriate in scale, proportion, and detail with appropriate use of material, texture, articulation, and color in consideration of the surrounding design context.

**Overhead Contact System (OCS) Poles.** The design and installation of the OCS poles shall be consistent with the surrounding design context.

**Construction Staging/Stockpiled Materials and Equipment.** The active construction areas are primarily within street right-of-way and would have construction signs and barricades to delineate the work zone. In order to minimize views of stockpiled materials and idle construction equipment in staging areas, and to reduce visual clutter and disorder, project construction staging areas will be enclosed or screened from view at the street level with appropriate screening materials. Visual inspections will be completed to ensure the immediate surroundings of construction staging areas are free from construction-related clutter and to maintain the areas in a clean and orderly manner throughout the construction period.

**Restricted Access that Diminishes the Utility of a Section 4(f) Resource.** Access throughout the Project corridor would be maintained during construction and operation. No change to ingress or egress at any Section 4(f) resource is proposed as part of the Project.

**Vibration Impacts from Construction or Operation of the Project that Substantially Impair Use of a Section 4(f) Resource.** Generally, vibration impacts (in the context of constructive use under Section 4(f)) are only evaluated in relation to the potential for damage to historic buildings. The following analysis relates to public parks and recreation areas to support a comprehensive assessment.

Pershing Square and Angel’s Knoll are the only resources within 125 feet of the Project, and are the resources most likely to be affected by vibration. The Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ATS Consulting 2017) included a detailed vibration analysis. The analysis did not identify operational or construction impacts at either of these facilities. In addition, unexpected impacts would be minimized by Mitigation Measure **NV-C16**, which requires a Noise and Vibration Mitigation Coordinator to address community concerns. Therefore, there would be no construction or operational constructive use of the Section 4(f) public parks and recreational resources.

**Effect 4(f)-2: Historic Architectural Sites**

**No Use.** As discussed below, the Project would not result in a use of any Section 4(f) protected Historic Architectural Sites.
Historically, streetcars operated along the streets in the study area, and a system of poles and overhead wires existed for many decades, including during the period of significance for many of the NRHP-listed and eligible properties previously identified or identified during the survey conducted during the Section 106 analysis. Streetcar equipment was part of the historic-era setting; therefore, no historical resources will be impacted as a part of the Project. Formal Findings of Effect have been prepared and submitted to SHPO for review and concurrence with the findings as part of the Section 106 process. No adverse effect under Section 106 was identified on the historic buildings and districts along the Project alignment. The analysis considered direct and indirect impacts of the Project on the historic resources.

**Direct Use.** The Project would not require the acquisition of any of these Section 4(f) properties adjacent to the Project alignment or require a permanent easement; consequently, the Project would not result in a direct use of Section 4(f) property. No properties listed in or determined eligible for listing in the NRHP would be permanently incorporated into the Project. All Project components would be constructed within the street right-of-way, on sidewalks, in vacant lots, or in non-historic parking garages. No historic sidewalks or parking garages would be acquired or otherwise affected. No removal of historic properties or contributing features of historic properties is expected. The installation of the OCS poles would not require the removal of historic terrazzo within the Broadway Theatre and Commercial District. No resource listed in or determined eligible for listing in the NRHP would be demolished or materially altered.

Therefore, the Project would not result in a use of any of these Section 4(f) properties.

**Temporary Occupancy.** With the exception of the TPSS, the MSF, and the construction laydown area, all Project components would be constructed within the street right-of-way or sidewalks. The TPSS would be constructed on either non-contributing vacant lots within the Broadway Theatre and Commercial District, or within non-contributing or non-historic parking garages. The MSF would be constructed on parking lots with no structures. The construction laydown area would be constructed on parking lots with no structures.

Construction of two streetcar stops, sidewalk ramps, and curb bump-outs have the potential to cause physical damage to historic terrazzo sidewalks located at 601–605 South Broadway and 849 South Broadway, although it is not known definitively if construction activities would cause any damage. The terrazzo sidewalks at these locations are considered character-defining features of the Broadway Theatre and Commercial District. Measures to protect the terrazzo and preserve the material in place during construction would be required. These measures would reduce the potential to cause physical damage to the terrazzo and therefore would ensure no adverse effect to the historic district. Should incidental damage occur during construction, the terrazzo would be replaced in kind by a qualified contractor in a manner consistent with the Secretary's Standards for the Treatment of Historic Properties. As mentioned under 23 CFR 774.13[d] a temporary occupancy of a property does not constitute a use of a Section 4(f) resource if (1) the occupancy is of temporary duration and does not involve the change in ownership of the property; (2) the scope of work is minor, with only minimal changes to the protected resource; (3) there are no permanent adverse physical effects on the protected resource, and there would be no temporary or permanent interference with activities or purpose of the resource; and (4) the property being used would be fully restored to a condition that is at least as good as that which existed prior to the proposed project. Therefore, in satisfying such conditions for an exception to the requirement for Section 4(f) approval, a temporary use of a historic property would not result from the construction of the build alternatives.
No construction staging and/or construction easement would be required from any of the identified Section 4(f) properties. Construction work would take place within the road right-of-way, thereby avoiding the need for any temporary occupancy of Section 4(f) protected historic sites.

**Constructive Use.** Constructive use analysis is necessary to determine if any proximity impact(s) substantially impair the features or attributes that contribute to the NRHP eligibility of the historic site. If there is no substantial impairment, notwithstanding an adverse effect determination, there is no constructive use and Section 4(f) would not apply. None of the proposed station stops/platforms, the MSF, the OCS, or any of the TPSS structures would introduce visual, atmospheric, or audible elements that would diminish the integrity of a historic property's significant historic features.

The proposed station stops/platforms, the MSF locations, the OCS, and the TPSS structures would not introduce visual, atmospheric, or audible elements that would diminish the integrity of a historic property's significant historic features.

Platforms would be located adjacent to the sidewalk under the Project, although the Grand Avenue Extension would include a platform in the center of Grand Avenue. Platforms would be consistent with the surrounding streetscape and pose no potential for constructive use.

OCS would be installed along the Project alignment with decorative poles consistent with existing streetscape. A system of poles and overhead wires existed for many decades, including during the period of significance for many of the NRHP-listed or eligible properties previously identified or identified during the intensive survey. Overhead cables were part of the historic setting; therefore, although these poles would be visible from many of the historic properties within the APE, they would not pose a potential for constructive use. The OCS poles would not be installed where historic terrazzo, a character-defining feature of the Broadway Theatre and Commercial District, are present. The proposed TPSS would typically be located at parking lots or garages. Outside of the Broadway Theatre and Commercial District, no TPSS would be constructed on parcels with historic properties.

The potential for constructive use is limited to the following occurrences:

- Project-attributable noise levels that interfere with use and enjoyment of a noise-sensitive Section 4(f) protected facility;
- Impairment of aesthetic features or attributes of a Section 4(f) property where such features are considered important contributing elements to the value of the property;
- Restricted access that diminishes the utility of a Section 4(f) resource; or
- Vibration impacts from construction or operation of the project that substantially impair use of a Section 4(f) resource.

**Project-Attributable Noise Levels That Interfere with Use and Enjoyment of a Noise-Sensitive Section 4(f) Protected Facility.** According to the Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ATS Consulting 2017), the streetcar noise analysis is based on FTA guidance, which categorizes properties based on land use. Construction noise evaluation is based on City regulations. The FTA guidance does not take into account whether a building is eligible for or listed in the NRHP, unless it is a National Historic Landmark with significant outdoor use (Category 1, Special Buildings, Theaters, and Concert Halls). The Bradbury Building, located at 304 South Broadway, is the only National Historic Landmark in the APE, but it does not have significant outdoor use.

Based on the noise and vibration analysis conducted, no noise impacts related to the construction or operation of the Project are anticipated to affect historic properties or historical resources.
Impairment of Aesthetic Features or Attributes of a Section 4(f) Property Where Such Features Are Considered Important Contributing Elements to the Value of the Property. The Project would restore historic streetcar service in downtown Los Angeles. Historically, streetcars operated along the streets in the APE, and a system of poles and overhead wires existed for many decades, including during the period of significance for many of the NRHP-listed and eligible properties previously identified or identified during the intensive survey. Overhead cables were part of the historic setting. The introduction of new overhead wires and poles would not visually diminish the cohesive nature of the districts—conveyed by architectural style, materials, setbacks, and storefronts—because overhead wires, poles, street lamps, and traffic signals have been part of both the historic and current setting.

Although no visual impacts are anticipated, the Visual Impact Assessment for the Restoration of Historic Streetcar Service in Downtown Los Angeles (ICF International 2016) includes Project design features for the TPSS, the MSF, and OCS poles to ensure that the design conforms to City, state, and federal regulations, including (but not limited to) the BSMP, LAMC, and California Building Code (CBC). Significant views of historic buildings would not be adversely affected by Project features, and Project features would not create substantial shade/shadow effects that have the potential to adversely affect shade/shadow sensitive viewers. The 7th Street Alternative is not expected to result in incremental effects on visual resources, or on existing visual character and quality, that would be considered cumulatively adverse.

The significance of the Broadway Theatre and Commercial District is conveyed in part by the cohesive nature of the building setbacks, the materials used in the building façades, and the positioning of storefronts at street level. The significance of both the Downtown Hill Street Historic District and the West 7th Street Historic District is also conveyed by a cohesive grouping of buildings that demonstrate the growth of the City in the early decades of the twentieth century and display high style examples of popular architectural styles of the era. No setbacks would be changed, no building materials would be altered, and no storefronts would be changed.

The existing visual environment at each of the Section 4(f) resources is dominated by the urban character of their surroundings. Beyond implementing the streetcar system, the Project would not substantially alter the visual landscape and would have little to no effect on the visual character and value of the resources located within the study area. Nonetheless, the following Project design features are recommended to ensure that Project design components are built with sensitivity to the visual environment.

Design of Traction Power Substation (TPSS) Structures. All TPSS structures shall be designed to minimize their presence in visual terms. Where site and design allow, design and location features shall be incorporated, such as the minimization of the size of the structures, setbacks from adjoining street frontages, screening, and/or architectural treatment that is appropriate to its design setting where visible from the public right-of-way at street level. Should a TPSS be located within the public right-of-way, it shall be designed in conformance with the “Los Angeles Above-Ground Facility” regulations contained in Section 62.08 of the LAMC.

Maintenance Storage Facility (MSF) Design. The MSF building treatments and architecture shall be appropriate in scale, proportion, and detail with appropriate use of material, texture, articulation, and color in consideration of the surrounding design context.

Overhead Contact System (OCS) Poles. The design and installation of the OCS poles shall be consistent with the surrounding design context.
Construction Staging/Stockpiled Materials and Equipment. The active construction areas are primarily within street right-of-way and would have construction signs and barricades to delineate the work zone. In order to minimize views of stockpiled materials and idle construction equipment in staging areas, and to reduce visual clutter and disorder, project construction staging areas will be enclosed or screened from view at the street level with appropriate screening materials. Visual inspections will be completed to ensure the immediate surroundings of construction staging areas are free from construction-related clutter and to maintain the areas in a clean and orderly manner throughout the construction period.

Restricted Access That Diminishes the Utility of a Section 4(f) Resource. Access throughout the Project corridor would be maintained during construction and operation. No change to ingress or egress at any Section 4(f) resource is proposed as part of the Project.

Vibration Impacts from Construction or Operation of the Project That Substantially Impair Use of a Section 4(f) Resource. Some construction activities associated with the Project could result in an increase in ground-borne vibration. At this time, it is not known what types of activities or the types of machinery are going to be used during construction. Therefore, it is not known if physical destruction or damage to historic properties would occur as a result of construction. The Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ATS Consulting 2017) provides measures that would minimize the potential for damage, such as preconstruction surveys to identify at-risk historic properties; set vibration limits; and require vibration monitoring (Mitigation Measures NV-C12 through NC-C16). The report also proposes alternative procedures that would lower vibration levels. The contractor would be required to abide by the measures; these measures would reduce the potential for an adverse effect. Historic buildings were previously exposed to streetcar-generated vibration when the historic Los Angeles Railway (LARy) and Pacific Electric streetcar systems formerly operated along downtown streets.

4.7.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would affect one additional Section 4(f) resource, which is the Disney Concert Hall. Disney Concert Hall is eligible for listing in the NRHP. Potential effects discussed above for the Project are applicable to the Grand Avenue Extension Design Option except for noise. Section 4.11, Noise and Vibration, identifies a potential impact from audible noise. A moderate noise effect is predicted outside the Disney Concert Hall. Importantly, adverse noise effects were not identified within the Disney Concert Hall. The sources of streetcar noise impacts outside the Disney Concert Hall are the combination of: 1) wheel impacts at special trackwork and 2) potential squeal noise from tight curves located on Grand Avenue and 1st Street. The use of a “low impact” frog at the special trackwork would reduce the wheel impact noise. Use of one of several rail lubricants is usually sufficient to control wheel squeal. However, because of the steep grade of the track there is concern with the use of a lubricant at this location. The FTA Guidance Manual discusses wheel squeal from LRT vehicles and not from streetcars. It is less likely that wheel squeal would occur with a streetcar which is about 20 feet shorter than an LRT vehicle and 66-foot radii curves that are designed for the LA streetcar. The issue of wheel squeal, if it occurs at this location, would be addressed during pre-revenue operations. If it does occur the use of wheel dampers would control the wheel squeal without using a lubricant. This impact would be reduced to less than adverse by Mitigation Measure NV-O1, presented in Section 4.11, Noise and Vibration, through installing a “low impact frog” at the 1st Street and Hill Street intersection and wheel dampers. The construction analysis presented above for the Project also applies to the Grand Avenue Extension Design Option.
Avenue Extension Design Option. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would not result in an adverse effect related to 4(f) resources.

4.7.3 Measures to Minimize Harm

Refer to Avoidance and Minimization Measure CUL-O1 in Section 4.4, Cultural Resources, NV-O1 in Section 4.11, Noise and Vibration, and AES-O1 through AES-O3 in Section 4.14, Visual Quality.

4.8 Greenhouse Gas (GHG) Emissions

This section describes the potential for adverse energy impacts related to GHG emissions and climate change. The information presented in this section is based on the Air Quality and Climate Change Assessment Report, which is included as Appendix D. Refer to this appendix for a detailed description of the affected environment that is summarized below.

4.8.1 Affected Environment

GHG emissions refer to a group of emissions that are generally believed to affect global climate conditions. The greenhouse effect compares Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, as defined in accordance with Section 19(i) of Executive Order (EO) 13514 (Focused on Federal Leadership in Environmental, Energy, and Economic Performance), include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These GHGs, in addition to water vapor, keep the average surface temperature of Earth close to 60 degrees Fahrenheit (°F).

More than 97 percent of U.S. GHG emissions are the result of burning fossil fuels. Of these GHGs, 83 percent are in the form of CO2, 10 percent are CH4, and 4.5 percent are N2O. Fossil fuels are burned to power vehicles, create electricity, and generate heat. Vehicle emissions are the largest source of CO2 emissions in California, representing 38 percent of statewide emissions in 2011. Electrical generation is the second-largest source of GHG emissions in California, at 19 percent; commercial and residential land uses are the third-largest, at 10 percent (CARB 2013). On a national level, electrical generation is the largest GHG emissions sector, and transportation is the second largest. Other sources of GHG emissions generated within the U.S. and California include agriculture, land clearing, the landfilling of waste, refrigerants, and certain industrial processes.

Although there is currently no federal overarching law specifically related to climate change or the reduction of GHGs, the EPA is developing regulations that may be adopted pursuant to the EPA’s authority under the CAA. In Coalition for Responsible Regulation, Inc., et al. v. EPA, the United States Court of Appeals upheld the EPA’s authority to regulate GHG emissions under the CAA. Foremost among recent developments have been the settlement agreements between the EPA, several states, and Non-Governmental Organizations to address GHG emissions from electric generating units and refineries; the U.S. Supreme Court’s decision in Massachusetts v. EPA; and the EPA’s “Endangerment Finding,” “Cause or Contribute Finding,” and Mandatory Reporting Rule.
FTA recently issued a *Programmatic Assessment for Green House Gas Emissions* (FTA 2017). This programmatic assessment serves to (1) report on whether certain types of proposed transit projects merit detailed analysis of their GHG emissions at the project level and (2) be a source of data and analysis for FTA and its grantees to reference in future environmental documents for projects in which detailed, project-level GHG analysis is not vital. Although the programmatic applicability relates streetcar projects, the existing analysis has been maintained for consistency with the recently completed CEQA process.

### 4.8.2 Environmental Consequences

#### 4.8.2.1 No Build Alternative

**Not Adverse.** Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist in without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect. However, it is important to note that the No Build Alternative would not result in beneficial GHG effects discussed below for the Project.

#### 4.8.2.2 7th Street Alignment Alternative

**Effect GHG-1: GHG Emissions**

**Beneficial.** Regional GHG emissions associated with operations would result from (1) the net change in passenger VMT that would occur within the study area under the Project compared to the No Build Alternative; (2) employee trips (mobile source) and energy demand (area and stationary-source) emissions related to MSF lighting, water heating, and temperature control; and (3) the emissions from electricity generation needed to power streetcar operations.

The *Air Quality and Climate Change Assessment Report* includes a detailed methodology discussion related to the calculation of GHG emissions. Briefly, the Project is anticipated to result in a daily reduction of VMT due primarily to diversion of private automobile trips to the transit system. The CT-EMFAC2014 model was used to estimate the emission reductions. It is anticipated that the Project would reduce VMT by 6,327 and 7,431 miles per day in early 2021 and 2040, respectively. The CalEEMod model was used to estimate emissions related to MSF operations. Emissions related to streetcar operations were based on the estimates of system energy demand, which include emissions related to energy demand and employee trips. Table 4.8-1 shows estimated emission reductions associated with the Project. Therefore, the Project would result in a beneficial effect related to GHG emissions.
Table 4.8-1. Greenhouse Gas Emissions (metric tons CO₂e per year)

<table>
<thead>
<tr>
<th>Source Description</th>
<th>Project</th>
<th>Project With Grand Avenue Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Passenger Vehicle Emissionsa</td>
<td>(1,496)</td>
<td>(1,865)</td>
</tr>
<tr>
<td>Maintenance Facility Emissionsb</td>
<td>375</td>
<td>375</td>
</tr>
<tr>
<td>Streetcar Operations Emissionsc</td>
<td>540</td>
<td>573</td>
</tr>
<tr>
<td>Total Project Emissions</td>
<td>(533)</td>
<td>(866)</td>
</tr>
</tbody>
</table>


a The emissions are conservatively based on 2015 Existing Plus Project conditions from the EIR. Emissions would be less in early 2021 and 2040 conditions due to increased ridership and reduced VMT.

b Road Construction Emissions Model and CalEEMod output sheets are provided in Appendix D.

c The Project would have an electricity demand of 63,542 kilowatts (kWh) per week. The Grand Avenue Extension Design Option would have an electricity demand of 60,115 kWh per week.

Note: Emissions are based on VMT estimates developed for the EIR. The VMT analysis has since been updated resulting in additional Project-related VMT reductions of 603 and 664 miles per day in early 2021 and 2040, respectively. The Project with Grand Avenue Extensions would result in additional VMT reductions of 559 and 687 miles per day in early 2021 and 2040, respectively. It is anticipated that emission reductions would be slightly greater than what is shown in this table due to the higher VMT reduction.

Effect GHG-2: Climate Change Effects

Not Adverse. Several impacts on the environment are expected throughout California as a result of global climate change. The extent of these effects is being defined as climate modeling tools become more refined. Regardless of the uncertainty in precise predictions, it is widely understood that substantial climate change is expected to occur in the future. Potential climate change impacts include, but are not limited to, extreme heat events, increased water and energy consumption, and changes in species distribution and range. Certain low-lying areas may be susceptible to flooding that has been influenced by climate-change events. The entire alignment would be above the 100-year floodplain. The project would not alter water surface elevations of the 100-year flood. The Project would be consistent with development plans for the area and would not significantly change the land use in the area because it is currently developed or zoned for development. The Project would not expose people or structures to the risk of flooding, create floodplains, or result in an increase in the base flood elevation. Natural and beneficial floodplain values would not be affected by the Project. A range of other potential climate change impacts may affect the Project, including increased temperatures, heat stress days, and water supplies. The Project has no component that would not exacerbate these issues. Therefore, the Project would not result in an adverse effect related to climate change.

4.8.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would further reduce GHG emissions beyond the reductions estimated for the Project. The additional alignment would increase ridership by 1,679 riders in early 2021 and 2,390 riders in 2040. This would result in an additional VMT reduction of 1,404 miles per day in early 2021 and 1,862 miles per day in 2040. As shown in Table 4.8-1, above, there would be a reduction in mobile-source emissions with the Grand Avenue Extension. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would result in a beneficial effect related to GHG emissions and would not result in an adverse effect related to climate change effects.
4.8.3 Measures to Minimize Harm

Operational effects related to GHG emissions and climate change would not be adverse. No measures to minimize harm are required.

4.9 Land Acquisition, Displacements, and Fiscal Impacts

This section provides an overview of potential land acquisition, potential displacements, and associated economic effects associated with implementation of the Project. Land acquisitions are discussed as full or partial acquisitions. Both full and partial land acquisitions could result in the displacement of improved properties, their current uses and occupants.

4.9.1 Affected Environment

The Project area is located entirely within the central business district of the City of Los Angeles. This area is comprised of developed land parcels containing uses that include high rise office buildings, multi-story government buildings, commercial service and retail businesses of various types and sizes, multi-story residential buildings, hotels, and commercial parking lots. Based on the Los Angeles City Council Districts Economic Report 2016, overall employment in the City grew 2 percent to 1.4 million jobs from the third quarter of 2014 to the third quarter of 2015. Private sector employment also grew 2 percent, accounting for 1.4 million jobs. Property tax revenues in the City of Los Angeles for FY 2015-2016 was approximately $1.79 billion, based upon an assessed valuation of approximately $8.58 billion (City of Los Angeles, Fiscal Budget 2016).

4.9.2 Environmental Consequences

4.9.2.1 No Build Alternative

Not Adverse. Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect. However, it is important to note that the No Build Alternative would not result in land acquisition associated with MSF sites or TPSS locations or beneficial regional economic effects discussed below for the Project.

4.9.2.2 7th Street Alignment Alternative

Effect ECO-1: Land Acquisitions

Not Adverse with Mitigation. Streetcar tracks and supporting operational features, including the placement of station boarding platforms, would occur within publicly owned rights of way. These activities would not require full or partial site acquisitions. However, the installation of TPSS units would require partial acquisitions and the selected MSF site would require full acquisitions. The potential acquisitions required for the MSF and TPSS sites are shown in Tables 4.9-1 and 4.9-2.
Table 4.9-1. Property Acquisitions Required for 2nd and Broadway MSF Site

<table>
<thead>
<tr>
<th>Assessor Parcel No.</th>
<th>Address</th>
<th>Property Type</th>
<th>Land Value</th>
<th>Improvements Value</th>
<th>2016 Real Estate Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>5149-009-003</td>
<td>245 S. Broadway</td>
<td>Parking Lot</td>
<td>$550,329</td>
<td>$4,117</td>
<td>$8,351</td>
</tr>
<tr>
<td>5149-009-004</td>
<td>237 S. Broadway</td>
<td>Wedding Chapel</td>
<td>$1,027,528</td>
<td>$404,869</td>
<td>$19,251</td>
</tr>
<tr>
<td>5149-009-011</td>
<td>236 S. Hill St.</td>
<td>Parking Lot</td>
<td>$944,196</td>
<td>$6,733</td>
<td>$13,483</td>
</tr>
<tr>
<td>5149-009-014</td>
<td>229 S. Broadway</td>
<td>Parking Lot</td>
<td>$3,092,042</td>
<td>$3,346</td>
<td>$40,125</td>
</tr>
<tr>
<td>5149-009-018</td>
<td>233 S. Broadway</td>
<td>Vacant Commercial</td>
<td>$1,247,934</td>
<td>$324,460</td>
<td>$24,163</td>
</tr>
<tr>
<td>5149-009-025</td>
<td>240 S. Hill St.</td>
<td>Parking Lot</td>
<td>$443,641</td>
<td>$3,965</td>
<td>$6,194</td>
</tr>
</tbody>
</table>

Totals              | $7,305,670         | $747,490        | $111,567   |


Table 4.9-2. Property Acquisitions Required for 11th Street and Olive Street (East) MSF Site

<table>
<thead>
<tr>
<th>Assessor Parcel No.</th>
<th>Address</th>
<th>Property Type</th>
<th>Land Value</th>
<th>Improvements Value</th>
<th>2016 Real Estate Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>5139-019-011</td>
<td>1124 S. Olive St.</td>
<td>Parking Lot</td>
<td>$3,381,020</td>
<td>$1,034</td>
<td>$41,873</td>
</tr>
<tr>
<td>5139-019-015</td>
<td>218 W. 11th St.</td>
<td>Parking Lot</td>
<td>$1,586,438</td>
<td>$1,034</td>
<td>$19,579</td>
</tr>
<tr>
<td>5139-019-040</td>
<td>1100 S. Olive St.</td>
<td>Parking Lot</td>
<td>$10,507,570</td>
<td>$1,034</td>
<td>$131,371</td>
</tr>
</tbody>
</table>

Totals              | $15,475,028       | $3,102          | $192,823   |


Potential TPSS unit locations are shown in Table 4.9-3. TPSS units located within private property would require an easement or fee interest from the property owner. The installation footprint would be approximately 200 square feet in area. No displacements of permanent improvements would be required and the installation would be sited so as not to compromise or impair the function of the property. Compliance with the Uniform Act ensured through Mitigation Measure ECON-O1 would minimize potential impacts. Therefore, the Project would not result in an adverse effect related to partial property acquisitions.
## Table 4.9-3. Potential Acquisitions for Traction Power Substation (TPSS) Sites

<table>
<thead>
<tr>
<th>TPSS</th>
<th>Priority for Location</th>
<th>Address</th>
<th>APN</th>
<th>Parcel Square Footage</th>
<th>Acquisition Type</th>
<th>Existing Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPSS Option</td>
<td>Recommended</td>
<td>Within Public ROW</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Transportation right-of-way</td>
</tr>
<tr>
<td>Alternative</td>
<td>131 S. Olive St.</td>
<td>5149-010-949</td>
<td>192,480</td>
<td>Partial</td>
<td>Parking structure</td>
<td></td>
</tr>
<tr>
<td>TPSS Option</td>
<td>Recommended</td>
<td>208 S. Broadway</td>
<td>5149-008-030</td>
<td>8,540</td>
<td>Partial</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td>Alternative</td>
<td>229 S. Broadway</td>
<td>5149-009-014</td>
<td>18,960</td>
<td>Partial</td>
<td>Surface parking lot</td>
<td></td>
</tr>
<tr>
<td>Alternative/ Temporary</td>
<td>213 S. Spring St.</td>
<td>5149-008-029</td>
<td>471,443</td>
<td>Partial</td>
<td>Parking structure</td>
<td></td>
</tr>
<tr>
<td>TPSS Option</td>
<td>Recommended</td>
<td>826 S. Broadway</td>
<td>5144-016-062</td>
<td>8,179</td>
<td>Partial</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td>Alternative</td>
<td>913 S. Broadway</td>
<td>5139-003-003</td>
<td>7,661</td>
<td>Partial</td>
<td>Surface parking lot</td>
<td></td>
</tr>
<tr>
<td>Alternative</td>
<td>951 S. Broadway</td>
<td>5139-003-009</td>
<td>4,766.10</td>
<td>Partial</td>
<td>Surface parking lot</td>
<td></td>
</tr>
<tr>
<td>TPSS Option</td>
<td>Recommended</td>
<td>833 S. Flower St.</td>
<td>5144-021-041</td>
<td>180,458</td>
<td>Partial</td>
<td>Parking structure</td>
</tr>
<tr>
<td>Alternative</td>
<td>928 S. Figueroa St.</td>
<td>5138-002-029</td>
<td>8,325</td>
<td>Partial</td>
<td>Surface parking lot</td>
<td></td>
</tr>
<tr>
<td>TPSS Option</td>
<td>Recommended</td>
<td>431 S. Hill St.</td>
<td>5149-027-013</td>
<td>32,460</td>
<td>Partial</td>
<td>Surface parking lot</td>
</tr>
<tr>
<td>Alternative</td>
<td>628 S. Hill St.</td>
<td>5144-003-024</td>
<td>1,225</td>
<td>Partial</td>
<td>Jewelry store</td>
<td></td>
</tr>
</tbody>
</table>

Source: City of Los Angeles Department of Transportation 2017.

### Effect ECO-2: Economic Effects

**Beneficial Effect.** Operation of the Project would support development and increase tourism and tax revenues, resulting in economic benefits to the Project area and surrounding communities. Although an indirect effect of the Project's supportive role in revitalization and development may be an increase in property values and a boost in tourism, which could also have the potential to increase leasing rates for existing businesses in the study area, and in turn change the mix of business tenants. Regardless, given the Project's supportive role for growth and revitalization, increased investment in the community would be consistent with those objectives.

No residents would be displaced by the Project. However, as discussed above, the wedding chapel associated with the 2nd Street and Broadway MSF could require relocation. The wedding chapel has been operating at its present site for a number of years and has developed a stable clientele for its services and it is possible that the business would be able to relocate within the general vicinity and continue to serve its clientele. Other locations, with similar access and floor area, are also available within the Central Business district. Should this not be possible, due to higher rental rates or other reasons, the displacement of employees is not considered substantial in the context of other service and retail opportunities available within the central business district. The property owner would be compensated for the sale of the property and the business owner and employees would receive
relocation assistance, per *Uniform Act*. In the event of the relocation within the district, no loss of property taxes would occur as a result of its implementation. The Project may indirectly lead to increased property value as part of the overall revitalization efforts taking place in Downtown. This would result in improved tax revenues as a result of increased property values.

Compared to the total amount of property tax revenue for the County and City of Los Angeles, property acquisitions would lead to relatively minimal property tax revenue loss. The Project would not result in property tax losses in excess of 0.1 percent of the County of Los Angeles’ tax base, which is approximately $12.8 billion in property tax revenues during the 2015-2016 fiscal year (Los Angeles County Auditor 2016). As the total amount of privately-owned parcels identified for acquisition is considered relatively small to the property inventory in the study area, the resulting loss of property tax revenues currently being generated by these properties would be considered minimal.

Based on the above analysis, the Project would not result in an adverse effect related to economic factors.

### 4.9.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would not require full or partial property acquisitions beyond what was identified for the Project. Streetcar tracks and supporting operational features, including the placement of station boarding platforms, would occur within publicly owned rights-of-way. The alignment for the Grand Avenue Extension would not include an additional MSF site or TPSS unit location. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would not result in an adverse effect related to land acquisition, displacements, and fiscal impacts.

### 4.9.3 Measures to Minimize Harm

**ECON-01: Business Displacement.** Proposed displacement of the Guadalupe Wedding Chapel and any other businesses subject to displacement as a result of the Project would occur in accordance with applicable laws and regulations, including the *Uniform Business Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as mentioned. Compensation to the property owner and business operators and relocation assistance would be provided.

### 4.10 Land Use and Zoning

This section provides an overview of potential land use and zoning effects associated with implementation of the Project. The analysis includes land use consistency and land use compatibility.

#### 4.10.1 Affected Environment

The affected environment is summarized below. Refer to Section 3.8, Land Use and Planning, of the Draft EIR for a comprehensive discussion of existing land use plans, land uses, and zoning. The study area generally encompasses the area bounded by Cesar Chavez Avenue on the north, Interstate 10 on the south, Interstate 110 on the west, and Alameda Street on the east. This area is an urban environment where major transportation facilities and dense development exists.
Downtown Districts

The study area is located within the Central City Community Plan area. The Central City Community Plan identifies nine districts: Civic Center, Bunker Hill, Financial Core, South Park, Convention Center/Arena, Center City/Historic Core, Central City East, South Markets, and Little Tokyo. As indicated in the Central City Community Plan and described below, district boundaries have become blurred. They overlap as land uses change over time. Figure 4.10-1 shows the general locations of these districts in relation to the Project, and each district is discussed in detailed below.

Civic Center

This district is located in the northern portion of the Central City Community Plan area. It includes several federal, state, county, and local government offices along the Civic Center Mall, north of 1st Street, and generally from the Harbor Freeway to Alameda Street. The district is home to the historic City Hall and the Cathedral of Our Lady of the Angels. The streetcar would run along the southern Civic Center boundary on 1st Street.

Bunker Hill

This district is located in the northwestern portion of the Central City Community Plan area, adjacent to the Civic Center District. Adopted in 1959, the Bunker Hill Redevelopment Project was conceived as a new mixed-use development. This district includes the Museum of Contemporary Art (MOCA), Colburn School of Performing Arts, Disney Concert Hall, and the recently opened Broad Museum. The streetcar would run along the eastern Bunker Hill boundary on Hill Street.

Financial Core

This district is located south of the Bunker Hill District, in the western portion of the Central City Community Plan area. The streets of this district have a varying character. This district includes high-rise office developments, including the Gas Company Tower and the Citicorp Center. The Central Library, constructed in 1926, is also located in this district. The streetcar would run through the central Financial Core along 7th Street and Figueroa Street.

South Park

This district is located east of the Convention Center/Arena District. Specifically, this district, which is generally bounded by 8th Street, Main Street, the Santa Monica Freeway, and the Harbor Freeway, includes a variety of land uses. Land uses include Grand Hope Park and multi-family residential, commercial, retail, and office uses. The district also includes hotels, restaurants, and entertainment venues. This district borders the Convention Center/Arena District. The streetcar would run through northern South Park along 11th Street and Figueroa Street.

Convention Center/Arena

This district, which includes the Los Angeles Convention Center and Staples Center, is strategically located in the southwestern edge of the Central City Community Plan area, at the hub of the Harbor and Santa Monica Freeways. According to the Central City Community Plan, the sphere of influence of this district includes portions of the Financial Core and South Park. The streetcar would run along Figueroa Street in the northeastern corner of the Convention Center/Arena district.
Figure 4.10-1. Downtown Los Angeles Districts
Center City/Historic Core

This district extends from 1st Street to approximately 11th Street between Los Angeles Street and Hill Street. This district contains some of the most historically significant buildings in the region, including nationally recognized historic theater buildings. Additionally, the southern portion of this district houses the garment district. The California Mart, located on Main Street, between 9th Street and Olympic Boulevard, is a 3-million-square-foot complex that serves the garment industry. The streetcar would run along Broadway and along Hill Street through the Center City/Historic Core District.

Central City East

This district, located in the eastern portion of the Central City Community Plan area, contains wholesale and warehousing uses, including uses related to produce, fish, and dairy products. This district also includes social service uses and state and federal governmental agencies. The streetcar would not run through the Central City East District.

South Markets

This district is located in the southern portion of the Central City Community Plan area. This district contains a variety of garment, retail, manufacturing, industry, and flower warehouse uses, which are located in generally low-rise buildings. The streetcar would not run through the South Markets district.

Little Tokyo

This district is considered the spiritual, cultural, and symbolic center of the largest Japanese-American community in the continental United States. References to Japanese culture exist throughout the district in the form of decorative roofs, signs, garden designs, and other architectural and cultural elements. This district includes the Japanese-American National Museum, Union Center of the Arts, Hongwanji Buddhist Temple, and various multi-family residential uses. The streetcar would not run through the Little Tokyo district.

Surrounding Land Uses

As shown in Figure 4.10-2, the study area contains the following general plan–designated land uses: industrial, commercial, multi-family residential, public facilities, and open space. In general, industrial land uses are located in the southeastern portion of the study area, in the South Markets District. Commercial land uses are located primarily in the central, southern, and eastern portions of the study area. In recent years, areas along the Project alignment have seen a marked increase in residential and mixed-use land uses, with approximately 9,400 housing units built in downtown between 2000 and 2012. The Adaptive Reuse Ordinance, which was approved in 1999, has had a significant positive impact on development of residential uses because it has made it possible to provide housing units in many of downtown's existing commercial buildings. As a result, general plan land use designations for the downtown area, as depicted in Figure 4.10-2, do not always accurately reflect the actual mix of land uses within a given property. Many, if not most, of the commercial properties along the Project alignment are best described as mixed use, containing both commercial and residential uses, despite their general plan single-use designation.
Figure 4.10-2. Land Uses
Within the Civic Center, many land uses are government-owned buildings that employ city, state, and federal workers. The multi-family residential areas range from the single-resident occupancy (SRO) hotels in the Central City East area to the high-rise condominiums and apartments in the South Park neighborhood. There are multi-family residential areas on Bunker Hill, adjacent to Broadway on Spring Street, and on 9th Street. Public facilities are clustered primarily in the northern part of the study area, in the Civic Center, and the southern area, which surrounds the Convention Center. The largest open spaces in the study area are Grand Park in the Civic Center, Pershing Square in the Financial District, and Spring Street Park.

The City of Los Angeles Planning and Zoning Code (Zoning Code) includes standards for different land uses and identifies which land uses are allowed in various zoning districts. Specifically, the Zoning Code consolidates and coordinates all existing zoning regulations and provisions to designate, regulate, and restrict locations and land uses. Figure 4.10-3 provides a map of the zoning designations in the study area.

Regional and Local Land Use and Transportation Plans

There are a number of regional and local land use and transportation plans relevant to the Project. These plans are discussed in detail in Section 3.8, Land Use and Planning, of the Draft EIR. In summary, the relevant plans include:

- SCAG Regional Comprehensive Plan
- SCAG 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy
- City of Los Angeles Planning and Zoning Code
- Citywide General Plan Framework
- Central City Community Plan
- Mobility Plan 2035
- City of Los Angeles Downtown Design Guide
- Bunker Hill Specific Plan
- Broadway Streetscape Master Plan
- Broadway Theatre and Entertainment District Design Guide
- Downtown Street Standards
- City of Los Angeles 2010 Bicycle Plan
- Historic Downtown Design Guidelines
- Los Angeles Sports and Entertainment District Specific Plan
- Convention and Event Center Specific Plan

4.10.2 Environmental Consequences

4.10.2.1 No Build Alternative

Not Adverse. Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.
Figure 4.10-3. Zoning Designations
4.10.2.2 7th Street Alignment Alternative

The FTA does not have specific definitions or thresholds regarding what constitutes an adverse effect related to land use and zoning. In general, NEPA requires consideration of both the context and intensity of a given project (40 CFR Part 1508.27). The significance of an action must be analyzed under several contexts, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies according to the setting for the proposed action. For instance, in the case of a site-specific action, significance usually depends on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. Intensity refers to the severity of an effect. Responsible officials must bear in mind that more than one agency may make decisions regarding partial aspects of a major action.

Effect LU-1: Land Use Plan Consistency

Not Adverse with Mitigation. The Project would either be directly supportive of or would not conflict with regional or local plans, policies, or regulations. Consistency with relevant plans, policies, and regulations is summarized below. In addition, Table 3.8-1 in Section 3.8, Land Use and Planning, of the Draft EIR comprehensively assesses goals, objectives, policies, and guiding principles. The Project would not conflict with applicable goals, policies, and objectives included in the City of Los Angeles General Plan and applicable specific plans and design guidelines. The Project would provide additional transportation infrastructure and services to support the projected needs of downtown populations and businesses and would make downtown more accessible to residents and visitors alike. The Project would be developed and designed to be fully integrated with all modes addressed in the Mobility Plan 2035, including mixed traffic flow, pedestrian movement and safety, and bicycle flow and safety.

Streetcar Alignment

SCAG Regional Comprehensive Plan. The Project would assist the RCP in achieving its objective to integrate land and transportation planning by restoring a transportation mode to downtown that formerly provided a direct linkage between areas and that would again provide an alternative mode of travel within downtown and directly link residential areas with employment and other opportunities within downtown. The Project would provide a mode of travel within downtown that would make it possible to avoid using the automobile for short trips. Because the streetcar would be electrically powered, it would also contribute to reducing air quality impacts and energy use. As a result, the Project would assist in reducing criteria pollutants and GHGs and meeting other sustainability objectives. Also, the MSF would be designed to be in conformance with current green building standards and practices, which would further contribute to the achievement of RCP objectives.

SCAG 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy. The Project would contribute to the goal of maximizing regional mobility and accessibility insofar as the downtown component of that goal is concerned by providing an alternative travel mode that otherwise would not be available. Operation of the streetcar route would be managed to ensure safe interaction among streetcar operations, use of the local street system by autos and buses, and shared use of street rights-of-way with pedestrians and bicycles. By adding another travel mode, the Project would contribute to maximizing the productivity of the downtown transportation system.

City of Los Angeles Zoning Code. The Zoning Code is used to address the MSF sites. The analysis follows this discussion of land use and transportation plans.
Citywide General Plan Framework. The Project would support objectives related to downtown circulation needs and provide an alternative mode of transportation. The Project would provide additional transportation infrastructure and services to support the projected needs of downtown populations and businesses. Specifically, the Project would support downtown circulation needs for existing and future residents, businesses, and visitors and would provide an alternative mode of transportation that would reduce the number of vehicle miles traveled in the study area.

Central City Community Plan. The Project would not conflict with objectives related to the downtown circulation system. This alternative would make downtown more accessible to residents and visitors alike. The Project would augment downtown circulator service by connecting downtown districts and activity centers, improving internal circulation, and enhancing the character and identity of the downtown by restoring a component of the City’s mass transit history. One of the primary objectives of the plan is to develop a street hierarchy to serve transit, traffic, pedestrian, open space, and truck access needs. The Project would directly contribute to this objective because it would offer a new transit mode to downtown and help to define the street hierarchy.

Mobility Plan 2035. The Project would not conflict with the purpose and goals of Mobility Plan 2035 because the introduction of streetcar service would support the multi-modal objectives of Mobility Plan 2035. Implementation of the Project would provide downtown residents and visitors with an alternative to the automobile while supporting the repurposing of streets. The Project would be developed and designed to be fully integrated with all modes addressed in the plan, including mixed traffic flow, pedestrian movement and safety, and bicycle flow and safety.

City of Los Angeles Downtown Design Guide. The Project would not conflict with the City of Los Angeles Downtown Design Guide because it would comply with all applicable requirements and specifications. Specifically, implementation of the Project would be done so as to be integrated into the comprehensive context-sensitive street standards (i.e., where stations are placed, how pedestrian access will be provided, how safety of movement would be maintained among the various modes operating on the street system). Regulatory Compliance Measure RCM-LU-O1 would ensure that the Project design would not conflict with applicable design guidelines.

Bunker Hill Specific Plan. The Project would not conflict with the Bunker Hill Specific Plan because it would be required to comply with all applicable requirements and specifications. Specifically, the Project would help create a transit-friendly environment and would comply with land use regulations and design specifications included in the Bunker Hill Specific Plan. The Project would respond to the stated purposes and intentions of the plan. In particular, the Project would contribute to the expansion of the transit network in a manner that would take into consideration the urban form and mix of land uses that it serves, one of the stated purposes of the Bunker Hill Specific Plan.

Broadway Streetscape Master Plan (BSMP). The Project would not conflict with the BSMP in that the plan supports bringing streetcar service back to the downtown area and Broadway in particular. The BSMP’s focus is to create a multi-modal, pedestrian-focused street that would support the historic theater district. In this respect, implementation of the Project would help achieve this focus of the plan by restoring an historic transportation mode that was an integral part of the area’s overall context. The Project would coordinate its streetscape components to be consistent with the simple, clean-lines objective that the plan proposes. It would not recreate an historic feature but rather restore the function that has been missing for many years. No views of key historic buildings would be impaired. Clear, understandable pedestrian connections would be apparent with the streetcar signage. Because the streetcar would be electrically powered, it would promote environmental responsibility. The Project would also be operated within the Broadway street cross...
Maintaining turn lanes at those intersections on Broadway within the BSMP is consistent with the current definition of the master plan, which allows for site-specific interpretation of the plan’s objectives. The Project would not conflict with the BSMP but, rather, would support it in many respects.

Broadway Theatre and Entertainment District Design Guide. The Project would not conflict with the design guidelines and standards that are intended to enhance the identity of the district. One of the objectives of the Project is to assist in recreating a recognizable and attractive entertainment district on Broadway that enlivens the corridor. The Project would offer increased opportunities for using the streetcar to gain access to multiple destinations and would be consistent with the goal of encouraging pedestrian-oriented and visitor-serving uses. The Project would encourage pedestrian-oriented and visitor-serving uses during the evening hours to expand activity centers within downtown and create better, safer linkages among downtown districts.

Downtown Street Standards. The Project would provide another travel mode within downtown and would not conflict with the purpose of the Downtown Street Standards. The concept of updating street designations based on a more comprehensive street hierarchy that balances traffic flow with other equally important functions of the street, including pedestrian needs and public transit. Development of the Project is being managed in close consultation with LADOT staff, and adherence to and recognition of established street standards would be maintained during Project design.

City of Los Angeles 2010 Bicycle Plan. The Project could interfere with the implementation of planned bike facilities or lanes in the study area. Streetcar vehicles would be equipped with audible warning devices, a TWC system, and safety and wayfinding signs. Furthermore, operators would undergo extensive training and continuing evaluation to ensure safety. The City would also develop transit safety programs, with the goal of raising streetcar safety awareness in the community. In locations where travel lanes would be shared among motor vehicles, streetcars, and bicycles, special signage would be provided to make bicyclist aware of how to travel safely, and additional measures would be in place to provide a safe riding environment. Refer to Section 4.12, Safety and Security, for a comprehensive discussion of bicycle safety.

Historic Downtown Design Guidelines. The Project would not conflict with the Los Angeles Conservancy Historic Downtown Design Guidelines because the portion of the Project within the boundaries of the guidelines would be required to adhere to design requirements that would apply to the placement, design, and functioning of the various elements of the streetcar, including the design and relationship of OCS poles to adjacent buildings and street furniture such as streetcar platforms and other components of the system. Where Project improvements could result in alterations to historic features, such alterations would be avoided or conducted so as to be in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties. Because the alternatives would adhere to the requirements of the Historic Downtown Design Guidelines, where applicable, and the guidelines are premised on the eventual reintroduction of streetcar service. This alternative would therefore not conflict with design guidelines for the Historic Core area. Refer to Section 4.4, Cultural Resources, for a comprehensive discussion of historic resources.

Los Angeles Sports and Entertainment District (LASED) Specific Plan. The Project would not conflict with the LASED Specific Plan because it would be subject to applicable requirements of the specific plan. The Project would provide several stops within the Specific Plan area and connect the area to other parts of downtown. The Project would provide an alternative mode of transportation within
the downtown area for visitors and residents and would encourage gathering in public places, including the attractions in the specific plan area.

**Convention and Event Center Specific Plan.** For the same reasons stated above for the LASED Specific Plan, the Project would not conflict with the Convention and Event Center Specific Plan. The Project would also be subject to applicable requirements of the specific plan and would provide an alternative mode of transportation within the downtown area for visitors and residents.

**Traction Power Substation (TPSS) Units**

Regarding TPSS, potential locations consist of vacant lots and parking areas and are zoned either commercial or residential. Within the commercially zoned parcels, installations of utility service facilities are specifically permitted as a use; they therefore would also be permitted as an ancillary occupancy of those parcels. While the zoning requirements pertaining to residentially zoned parcels do not specifically identify utility facilities as a permitted use, the degree to which the TPSS units would occupy space on the affected parcel would be incidental to the primary use, and careful placement and buffering (if necessary) would be provided to ensure that the installations would be compatible. The proposed units would be designed and sited so as to be consistent with applicable design or street standards including the **Downtown Street Standards** and the HDLADG; approval of the applicable City agency would be secured as part of the design process. Additionally, the Project would include all necessary discretionary approvals to ensure that the proposed facilities would be consistent with City of Los Angeles zoning requirements.

**Maintenance Storage Facility (MSF) Sites**

Regarding MSF sites, the 11th and Olive Streets (East) and the Broadway and 2nd Street sites are both zoned for commercial uses. Development of the MSF on either of the candidate sites would occur under the authority of Section 14.00 of the LAMC, Article 4, Public Benefit Projects. Section 14.00 of the LAMC provides that “Where not permitted by right or by Conditional Use Permit . . . . public benefit uses are permitted in any zone, unless restricted to certain zones or locations.” Several itemized land use categories are listed in the LAMC, including cemeteries, density increases for housing development projects, libraries, museums, fire or police stations, mobile homes parks, and other itemized uses. The category under which an MSF would be permitted is “Public Utilities and Public Services Uses and Structures.”

Section 14.00 of the LAMC further requires that certain performance standards, or alternative compliance measures, must be met for the public benefit uses allowed under Section 14.00 of the LAMC. For Public Utilities and Public Services Uses and Structures, the following performance standards are listed:

1. Security night lighting is shielded so that the light source cannot be seen from adjacent residential properties.
2. The use is conducted in conformance with the City’s noise regulations pursuant to Chapter 11 of the LAMC.
3. There are no outdoor public telephones on the site.
4. No buildings are higher than any buildings on adjoining property.
5. No guard dogs are used to patrol at night.
6. There is no use of barbed, razor or concertina wire.
7. Security lighting is provided in parking areas.

8. The property is improved with a ten-foot landscaped buffer along the periphery of the property which is maintained and is equipped with an automatic irrigation system.

9. Parking areas are landscaped pursuant to the requirements of LAMC Section 12.21A6.

10. Only one identification sign is displayed on the site and it is on the building face. The sign does not exceed 20 square feet and does not extend more than two feet beyond the wall of the building and does not project above the roof ridge or parapet wall (whichever is higher) of the building.

11. All graffiti on the site is removed or painted over in the same color as the surface to which it is applied within 24 hours of its occurrence.

12. The use meets the parking requirements of LAMC Section 12.21A (i.e., one space per 1,000 square feet of building area).

13. The site is a corner site.

14. Yards, at a minimum, should meet LAMC requirements or those prevalent on adjoining properties, whichever is the most restrictive.

15. The majority of frontage is on a major or secondary highway.

16. All streets, alleys or sidewalks adjoining the property meet standard street dimensions.

Should one or more of the above performance standards not be met, alternative compliance measures must be specified and an established procedure for their consideration and approval must be followed. The City of Los Angeles Director of Planning must find that the Project substantially meets the purposes of the performance standards and impose conditions to secure compliance. An appeal process is also provided for, which can be initiated by an applicant or any other aggrieved person. Mitigation Measure LU-O1 would ensure that final design activities would follow the above provisions of LAMC Section 14.00.

**Effect LU-2: Land Use Plan Compatibility**

**Not Adverse.** The Project would improve circulation within and among the different districts located in the Central City Community Planning area, including the Civic Center, Bunker Hill, Financial Core, South Park, and the Center City/Historic Core Districts of downtown Los Angeles. Additionally, the streetcar would operate within existing street rights-of-way that would be shared with motor vehicles and pedestrians. Therefore, the Project would not create a physical barrier that would physically divide or isolate a community or neighborhood.

Streetcars historically operated along the streets in the study area, and the restoration of streetcar service would not visually diminish the cohesive nature of the districts, as conveyed by architectural style, materials, setbacks, and storefronts, because overhead wires, poles, street lamps, and traffic signals have been and are part of the historic and current setting. Proposed restoration of streetcar service would be consistent with the development that occurred during the period when streetcars once operated on the streets in downtown Los Angeles and that still exists today. The Project would be compatible with existing land uses along the alignment, given proposed streetcar services would be introduced along existing streets. In addition, where required, mitigation is included in the EA to minimize adverse effects in some resource areas that overlap with land use compatibly (e.g., Mitigation Measure AES-02 related to MSF design).
Regarding TPSS, each unit would be a durable structure containing electrical and electronic equipment. All TPSS units would be located out of the public right-of-way with the exception of the TPSS unit at 2nd Street and Grand Avenue, which may occupy a portion of the sidewalk. The unit would be installed in a manner that would not obstruct pedestrian access. Operational activities associated with the TPSS units would not result in land use impacts. No residential communities or neighborhoods would be divided or isolated and disruptions to businesses or other land uses would not occur.

Regarding MSF sites, the 11th and Olive Streets (East), surrounding land uses include a mix of uses including parking, low rise commercial buildings, and multi-family residential uses. No residential uses would be displaced or disrupted, and proposed MSF construction activities would not create a physical barrier that would divide or isolate a residential community or neighborhood. The Broadway and 2nd Street sites would be compatible with surrounding land uses, consisting of commercial and residential buildings and surface parking, because it would satisfy the performance standards prescribed under the LAMC Section 14.00. Additionally, operational activities would comply with all applicable land use plans and policies.

4.10.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would result in the streetcar running along the southern Civic Center District boundary on 1st Street and northeastern Bunker Hill District boundary on Grand Avenue. The Project analysis presented above is applicable to the Grand Avenue Extension, which describes how the Project would not conflict with applicable goals, policies, and objectives included in the City of Los Angeles General Plan and applicable specific plans and design guidelines. In addition, Mitigation Measure LU-O1 would ensure that final design activities would follow the above provisions of LAMC Section 14.00. Similar to as discussed above for the Project, the Grand Avenue Extension Design Option would not result in an adverse effect related to land use and zoning.

4.10.3 Measures to Minimize Harm

**RCM-LU-O1: Downtown Design Guidelines.** Design of the Project would comply with all applicable guidelines and requirements included in the Downtown Design Guidelines and Public Benefit projects performance measures, if necessary.

**LU-O1: LAMC Public Benefits Projects Conformity.** The Project shall adhere to the requirements of LAMC Section 14.00 in all respects and shall follow all applicable procedures. All applicable performance standards or alternative compliance measures shall be addressed and all procedures for review and approval shall be followed. The City of Los Angeles BOE shall ensure the carrying out of the mitigation measure.

4.11 Noise and Vibration

This section describes the potential for adverse effects related to noise and vibration. The information presented in this section is based on the Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ATS Consulting 2017), which is included as Appendix H. Refer to this appendix for a detailed description of the affected environmental that is summarized below.
4.11.1 Affected Environment

The noise and vibration impact criteria for use on federally financed transit projects are defined in the FTA Transit Noise and Vibration Impact Assessment (FTA 2006), which is commonly referred to as the FTA Guidance Manual. The FTA guidelines, analysis methods, and criteria reflect the best available research on the topic.

Noise

Noise may be loud, unpleasant, unexpected, or undesired sound, typically associated with human activity that interferes with or disrupts the normal ongoing noise-sensitive activities of others. The decibel (dB) is a unit of measurement that indicates the relative amplitude of sound. There are several methods for characterizing sound. The most common is the A-weighted sound level or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations is utilized. The hourly equivalent sound level \( L_{eq} \) is the energy-mean A-weighted sound level present or predicted to occur during a specified interval. It is the equivalent constant sound level that a given source would need to produce to equal the fluctuating level of measured sound. The day-night sound level \( L_{dn} \) describes the 24-hour average, and includes a penalty for noise during nighttime hours. \( L_{dn} \) is approximately equal to the \( L_{eq} \) peak hour under normal traffic conditions (Caltrans 2006).

Noise-sensitive receptors typically include residences, hospitals, schools, guest lodging quarters, libraries, and certain types of passive recreational uses. Studies have shown that, under controlled conditions in an acoustics laboratory, a healthy human ear is able to discern changes in sound levels of 1 dBA. In the normal environment, however, changes in noise level of 3 dBA are considered just noticeable to most people. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as being twice as loud.

Existing ambient noise levels along the project corridor were documented through a series of daytime and nighttime measurements. The locations of the noise measurement sites are shown in Figure 4.11-1. Photographs from each site are included in the Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ATS Consulting 2017) (Appendix H). The ambient noise measurement results are summarized in Table 4.11-1.

The existing noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. were measured at Sites LT-1 through LT-6 as part of the 24-hour noise measurements. The primary existing noise source in the project area is vehicular traffic on streets along the streetcar alignment. The nighttime noise measurements are summarized in Table 4.11-2. These data form the baseline for characterizing the existing environment at residential receivers.

Vibration

Ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. The effects of ground-borne vibration include feelable movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for normal transportation projects. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin.
Figure 4.11-1. Noise and Vibration Measurement Locations

Table 4.11-1. Ambient Noise Measurement Results

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>Type of Land Use&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Duration (hours)</th>
<th>Start Time, hh:mm&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Distance (feet)&lt;sup&gt;c&lt;/sup&gt;</th>
<th>L&lt;sub&gt;eq&lt;/sub&gt; (day), dBA&lt;sup&gt;d&lt;/sup&gt;</th>
<th>L&lt;sub&gt;dn&lt;/sub&gt;, dBA&lt;sup&gt;e&lt;/sup&gt;</th>
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<tr>
<td>LT-1</td>
<td>417 Hill St</td>
<td>2</td>
<td>24</td>
<td>2:30 p.m.</td>
<td>25</td>
<td>63</td>
<td>66</td>
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<tr>
<td>LT-2</td>
<td>330 11&lt;sup&gt;th&lt;/sup&gt; St</td>
<td>2</td>
<td>24</td>
<td>1:10 p.m.</td>
<td>25</td>
<td>65</td>
<td>66</td>
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<tr>
<td>LT-3</td>
<td>939 Figueroa St</td>
<td>2</td>
<td>11:30 a.m.</td>
<td>25</td>
<td>69</td>
<td>72</td>
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<tr>
<td>LT-4</td>
<td>711 Hope St</td>
<td>2</td>
<td>1:30 p.m.</td>
<td>25</td>
<td>70</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>LT-5</td>
<td>756 Broadway</td>
<td>2</td>
<td>2:30 p.m.</td>
<td>25</td>
<td>73&lt;sup&gt;f&lt;/sup&gt;</td>
<td>76&lt;sup&gt;f&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>ST-1</td>
<td>Disney Concert Hall</td>
<td>1</td>
<td>12:10 p.m.</td>
<td>15</td>
<td>67</td>
<td>67&lt;sup&gt;f&lt;/sup&gt;</td>
<td></td>
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<tr>
<td>ST-2</td>
<td>Mosk Courthouse</td>
<td>1</td>
<td>1:20 p.m.</td>
<td>15</td>
<td>71</td>
<td>72&lt;sup&gt;f&lt;/sup&gt;</td>
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<td>ST-3</td>
<td>207 Broadway</td>
<td>1</td>
<td>2:35 p.m.</td>
<td>15</td>
<td>74</td>
<td>76&lt;sup&gt;f&lt;/sup&gt;</td>
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<tr>
<td>ST-4</td>
<td>Los Angeles Theater</td>
<td>1</td>
<td>12:40 p.m.</td>
<td>10</td>
<td>71</td>
<td>74&lt;sup&gt;f&lt;/sup&gt;</td>
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<td>ST-5</td>
<td>Orpheum Theater</td>
<td>1</td>
<td>1:50 p.m.</td>
<td>15</td>
<td>73</td>
<td>77&lt;sup&gt;f&lt;/sup&gt;</td>
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<tr>
<td>ST-6</td>
<td>Belasco Theater</td>
<td>1</td>
<td>1:15 p.m.</td>
<td>15</td>
<td>67</td>
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<td>ST-7</td>
<td>LA Live</td>
<td>3</td>
<td>2:30 p.m.</td>
<td>15</td>
<td>68</td>
<td>70&lt;sup&gt;f&lt;/sup&gt;</td>
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<td>ST-8</td>
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<td>3</td>
<td>1:50 p.m.</td>
<td>15</td>
<td>73</td>
<td>77&lt;sup&gt;f&lt;/sup&gt;</td>
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<td>3</td>
<td>2:00 p.m.</td>
<td>15</td>
<td>69</td>
<td>73&lt;sup&gt;f&lt;/sup&gt;</td>
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<tr>
<td>ST-10</td>
<td>Milner Hotel</td>
<td>2</td>
<td>2:00 p.m.</td>
<td>15</td>
<td>65</td>
<td>69&lt;sup&gt;f&lt;/sup&gt;</td>
<td></td>
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</tbody>
</table>

<sup>a</sup>Land use of the nearest sensitive receiver. Type 1 are Special Buildings, Theaters and Concert Halls, Type 2 are Residential land uses, and Type 3 are Institutional and Recreational Land Uses.
<sup>b</sup>Start time of the measurement.
<sup>c</sup>Distance of microphone from the centerline of the nearest traffic lane.
<sup>d</sup>Leq for the duration of the measurement during daytime hours (7:00 a.m. to 10:00 p.m.).
<sup>e</sup>Because the microphone at this site was on the ledge of a second-floor window and within 1 foot of the closest wall, the level includes a -5 dB adjustment factor to account for the potential noise increase from reflections off the wall.
<sup>f</sup>Estimated L<sub>dn</sub> based on the difference between L<sub>dn</sub> and daytime L<sub>eq</sub> at the closest long-term site.

Table 4.11-2. Ambient Nighttime Noise Measurement Results – 1-hour L<sub>eq</sub> (dBA)

<table>
<thead>
<tr>
<th>Start Hour hh:mm</th>
<th>Site LT-1 417 Hill St</th>
<th>Site LT-2 330 11th St</th>
<th>Site LT-3 939 Figueroa St</th>
<th>Site LT-4 711 Hope St</th>
<th>Site LT-5 901 Broadway</th>
<th>Site LT-6 756 Broadway</th>
</tr>
</thead>
<tbody>
<tr>
<td>22:00</td>
<td>59.7</td>
<td>62.9</td>
<td>66.1</td>
<td>63.9</td>
<td>69.0</td>
<td>72.7</td>
</tr>
<tr>
<td>23:00</td>
<td>59.1</td>
<td>59.6</td>
<td>66.8</td>
<td>62.9</td>
<td>62.9</td>
<td>71.7</td>
</tr>
<tr>
<td>00:00</td>
<td>58.0</td>
<td>55.7</td>
<td>66.4</td>
<td>62.1</td>
<td>61.3</td>
<td>70.2</td>
</tr>
<tr>
<td>01:00</td>
<td>57.9</td>
<td>54.0</td>
<td>66.8</td>
<td>62.6</td>
<td>60.6</td>
<td>68.9</td>
</tr>
<tr>
<td>02:00</td>
<td>57.3</td>
<td>53.5</td>
<td>64.2</td>
<td>63.6</td>
<td>59.1</td>
<td>76.3</td>
</tr>
<tr>
<td>03:00</td>
<td>56.9</td>
<td>53.2</td>
<td>64.2</td>
<td>62.1</td>
<td>60.4</td>
<td>71.1</td>
</tr>
<tr>
<td>04:00</td>
<td>58.4</td>
<td>54.3</td>
<td>62.2</td>
<td>61.9</td>
<td>63.2</td>
<td>75.8</td>
</tr>
<tr>
<td>05:00</td>
<td>60.9</td>
<td>58.1</td>
<td>65.8</td>
<td>63.9</td>
<td>68.1</td>
<td>77.9</td>
</tr>
<tr>
<td>06:00</td>
<td>62.5</td>
<td>63.0</td>
<td>68.3</td>
<td>68.6</td>
<td>70.2</td>
<td>79.7</td>
</tr>
</tbody>
</table>

The strength of ground-borne vibration diminishes (or attenuates) fairly rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by FTA are root-mean square velocity level, in velocity decibels (VdB) units, relative to one micro-inch per second to describe human response to transit vibration and peak. As a point of reference, the average person can barely perceive vibration velocity levels below 70 VdB (typically in the vertical direction). Typical background vibration levels are between 50 and 60 VdB, whereas levels for minor cosmetic damage to fragile buildings or blasting are generally in the neighborhood of 100 VdB (FTA 2006).

Existing vibration sources in the project area consist primarily of vehicular traffic and intermittent construction activities. Vehicular traffic is the only permanent vibration source that was observed in the project area. When vehicular traffic causes perceptible vibration, the source is usually traced to potholes, wide expansion joints, or other “bumps” in the roadway surface. Therefore, the FTA assessment procedures for vibration from rail transit projects do not require measurements of existing vibration levels. However, vibration propagation tests were performed at three theaters that are currently in use (Sites V-1 through V-3) because these land use are within a few feet of sidewalks and they are vibration-sensitive land uses. A description of the vibration propagation test is presented in the noise and vibration technical report included in the Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project (ATS Consulting 2017) (Appendix H).

### 4.11.3 Environmental Consequences

#### 4.11.3.1 No Build Alternative

**Not Adverse.** Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.

#### 4.11.3.2 7th Street Alignment Alternative

**Effect NV-1: Noise**

**Moderate Adverse with Mitigation.** The basic approach used to identify potential noise impacts was to identify sensitive receivers, determine existing conditions, develop prediction models, estimate future noise exposure at the representative receivers, and evaluate mitigation options. Noise and vibration impact criteria for use on federally financed transit projects are defined in the FTA Guidance Manual. The basic concept of the FTA noise impact criteria is that more project noise is allowed in areas where existing noise levels are high. For example, noise levels are higher in downtown areas than they are in suburban neighborhoods that are farther from loud noise sources, such as freeways. Therefore, FTA allows more project noise in noisier downtown areas than the relatively quieter suburban areas. Noise impacts are considered in relative terms and are defined as *moderate* or *severe* taking into account: (a) the land use type potentially affected, (b) the characteristics of the existing noise environment, and (c) the degree to which noise is added to that
environment. Figure 4.11-2 is used to make the impact determination. Table 4.11-3 lists the three land use categories that FTA uses for noise assessments, along with the noise metric that is used for each category. For Category 2 land uses, noise exposure is characterized using $L_{dn}$ while for Category 1 and Category 3 land uses, noise exposure is characterized using the maximum 1-hour $L_{eq}$. It is noteworthy that Category 2 land uses include residences, motels, hotels, and any other place where people typically sleep.

Table 4.11-3. FTA Land Use Categories and Noise Metrics

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Noise Metric (dBA)</th>
<th>Description of Land Use Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outdoor $L_{eq}(h)^a$</td>
<td>A tract of land where quiet is an essential element of the intended purpose of the land use. This category includes lands set aside for serenity and quiet. It also includes outdoor amphitheaters and concert pavilions as well as national historic landmarks with significant outdoor use. Also included are recording studios and concert halls.</td>
</tr>
<tr>
<td>2</td>
<td>Outdoor $L_{dn}$</td>
<td>Residences and buildings where people sleep. This category includes homes, hospitals, and hotels, places where nighttime sensitivity to noise is assumed to be high.</td>
</tr>
<tr>
<td>3</td>
<td>Outdoor $L_{eq}(h)^a$</td>
<td>Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches, places where it is important to avoid interference with speech, meditation, and reading. Cemeteries, monuments, museums, campgrounds, and recreational facilities can be included in this category. Certain historical sites and parks are also included.</td>
</tr>
</tbody>
</table>


$^a L_{eq}$ for the noisiest hour of transit-related activity during hours of noise sensitivity.

In accordance with the *FTA Guidance Manual*, mitigation to eliminate noise impacts must be investigated for both moderate and severe levels of impact. The manual also states that for severe impacts “...there is a presumption by FTA that mitigation is incorporated into the project unless there are truly extenuating circumstances that prevent it.” In considering mitigation for severe impacts in this study, the goal is to reduce noise levels to below the moderate impact threshold. FTA allows more discretion for mitigation of moderate impacts. Consideration is given to several factors, including cost, the number of sensitive receivers affected, community views, the amount by which the predicted levels would exceed the impact threshold, and the sensitivity of the affected receivers.

---

2 $L_{dn}$ = The average dBA level during a 24-hour day, obtained after the addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.

3 $L_{eq}$ = The average dBA level during the measurement period. The hourly $L_{eq}$ used for this report is denoted as dBA $L_{eq}[h]$. 

Figure 4.11-2. FTA Noise Impact Criteria

Streetcar

Regarding analysis assumptions, the noise impact analysis of streetcar operations included audible warning device noise at streetcar stops and stoplights but did not include warning horns. Warning horns would be used at the operators’ discretion to alert pedestrians and motor vehicle drivers to potential safety risks, the same way that horns are used on buses. The maximum speed for the streetcars would be 30 mph on Figueroa Street and 25 mph on the rest of the alignment. The speed would be 20 mph as streetcars approach stations and stops. The streetcar would operate every 7 minutes during peak hours (6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m.), every 10 minutes between 9:00 a.m. and 3:00 p.m., and every 15 minutes from 6:00 p.m. to 2:30 a.m. Noise from streetcar operations would be similar to what has been observed at modern streetcar systems in other cities. Modeling of wayside noise for the Project was based upon actual measurements conducted on operations of both the Portland and Seattle streetcars.

In accordance with FTA guidance, impacts were estimated based on exterior noise levels. Noise impact calculations were made at 57 receptor locations. These results are presented in Appendix H and are also shown in Table 4.11-4, below. At 53 receptors, no impact was found. Prior to mitigation, three locations were identified as having a moderate impact from streetcar operations for the Project. One location was identified under the Grand Avenue Extension Design Option, which is discussed below in Section 4.11.3.2.1. The locations of the receivers are shown in Figure 4.11-3.

Regarding streetcar operations:

- Moderate streetcar noise impacts are predicted at two multi-family residential (MFR) buildings on West 11th Street between Grand Avenue and Hope Street (R23). The existing noise level is 66 dBA Ldn and the Project noise level would be 63 dBA Ldn. The threshold for a moderate impact is 61 dBA Ldn. The affected building is at least 10 stories in height. Only the residential units on the 5th floor and lower would be affected, which includes 24 residential units with balconies. The only outdoor areas of human activity that would be exposed to streetcar noise would be these balconies. The balconies are currently exposed to street traffic noise levels that are higher than the predicted streetcar operational noise. The goal is to ensure noise levels do not exceed the moderate ambient range currently existing at certain points along the Project alignment. FTA guidance provides greater discretion in formulating mitigation measures where, as is the case here, ambient noise levels are already in the moderate range due to being located in a dense urban environment. For moderate noise impacts, FTA guidance states that mitigation measures should be considered and other factors taken into account to determine the magnitude of the impact and the need for mitigation. Mitigation measures, such as sound walls at the edge of the trackwork, are not feasible for this receiver because they would impede the flow of traffic. As the multi-family residence is sound insulated with double pane windows, there is no other mitigation that would be feasible for this receiver. Above the 5th floor, the noise would be sufficiently attenuated by distance to be below the moderate level. This apartment building, and the Kawada Hotel discussed below, are the only residential land uses (FTA Category 2) where potential for noise impact from streetcar operations was identified. In light of ambient noise measurements already in the moderate range at the MFR buildings, and in light of the fact that Project operational noise levels are lower than ambient street level noise for these locations, noise impacts from the Project are not considered adverse at these locations.
### Table 4.11-4. Summary of FTA Noise Impacts and Mitigation

<table>
<thead>
<tr>
<th>FTA Land Use Category</th>
<th>ID Number</th>
<th>Alternative</th>
<th>Land Use</th>
<th>Expected FTA Impact</th>
<th>Number of Impacted Receptors</th>
<th>Amount Exceeds Threshold (dBA)</th>
<th>Mitigation Option</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STREETCAR OPERATIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>R23</td>
<td>Project</td>
<td>Multi-Family Residential</td>
<td>Yes</td>
<td>No</td>
<td>24</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>R35</td>
<td>Project</td>
<td>Hotel</td>
<td>Yes</td>
<td>No</td>
<td>15</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>I2A</td>
<td>Project</td>
<td>Federal Courthouse</td>
<td>Yes</td>
<td>No</td>
<td>1</td>
<td>1 or 2</td>
</tr>
<tr>
<td>1</td>
<td>T2</td>
<td>Grand Avenue Design Option</td>
<td>Disney Concert Hall</td>
<td>Yes</td>
<td>No</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td><strong>MAINTENANCE AND STORAGE FACILITY (MSF) OPERATIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I3</td>
<td>2nd Street &amp; Broadway MSF</td>
<td>Guadalupe Wedding Chapel</td>
<td>Yes</td>
<td>No</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>


- See Figure 4.11-3a through 4.11-3b show receiver locations.
- Represents the number of residential units (Category 2 land uses) where the impact is predicted.
- The amount that predicted noise levels would exceed FTA moderate impact thresholds.
- Mitigation Option 1 is the use of a “low impact” frog at the nearest crossover.
  - Mitigation Option 2 is a combination of wheel damper and optimization of profiles to minimize wheel squeal.
  - Mitigation Option 3 is the use of wheel lubrication at tight radius track within the MSF yards.
  - Mitigation Option 4 is the use of “low impact” frogs at all turnouts within the MSF yards.
- The only outdoor areas of human activity that would be exposed to streetcar noise would be the balconies of the residential units. These areas are currently exposed to street traffic noise levels that are higher than the noise levels from streetcar operations would be. Mitigation measures, such as sound walls at the edge of the trackwork, are not feasible for this receiver because they would impede the flow of traffic. As the multi-family residence is sound insulated with double pane windows, there is no other mitigation that would be feasible for this receiver.
- There are no outdoor areas of human activity that would be exposed to streetcar noise. Mitigation measures, such as sound walls at the edge of the trackwork are not feasible for this receiver because the sound walls would impede the flow of traffic. As the hotel building is sound insulated with double pane windows, there is no other mitigation that would be feasible for this receiver.
- This potential impact would be eliminated if the Guadalupe Wedding Chapel is acquired as part of the Broadway and 2nd Street MSF, which is yet to be determined.
Figure 4.11-3a. Receiver Locations, Diagram 1

Figure 4.11-3b. Receiver Locations, Diagram 2

Figure 4.11-3c. Receiver Locations, Diagram 3

- Moderate streetcar noise impacts are predicted at the Kawada Hotel (R35). The existing noise level is 68 dBA $L_{eq}$ and the Project noise level would be 64 dBA $L_{eq}$. The threshold for a moderate impact is 63 dBA $L_{eq}$. The affected building is at least 10 stories in height and the affected units would be 15 hotel rooms without balconies. There are no outdoor areas of human activity at this receiver that would be exposed to streetcar noise. The 1st floor land uses include a cafe, a restaurant and a bakery. There are 15 rooms in the upper levels of this hotel that would be exposed to the streetcar noise. The predicted streetcar noise level increases the existing level by less than 1 decibel. Mitigation measures, such as sound walls at the edge of the trackwork are not feasible for this receiver because the sound walls would impede the flow of traffic. As the hotel building is sound insulated with double pane windows, there is no other mitigation that would be feasible for this receiver. In light of the fact that Project operational noise levels will only increase ambient noise levels by, at most, 1 dB at certain locations within the hotel, noise impacts from the Project are not considered adverse at these particular locations within the hotel.

- Moderate streetcar noise impacts are predicted at the Federal Courthouse (I2A) located on 1st Street between Hill Street and Broadway. The sources of streetcar noise impacts are the combination of: 1) wheel impacts at special trackwork and 2) potential squeal noise from tight curves located on the Hill Street/1st Street curve and the diamond crossing. The use of a “low impact” frog at the special trackwork would reduce the wheel impact noise. Use of one of several rail lubricants is usually sufficient to control wheel squeal. However, because of the steep grade of the track there is concern with the use of a lubricant at this location. The FTA Guidance Manual discusses wheel squeal from light rail transit (LRT) vehicles and not from streetcars. It is less likely that wheel squeal would occur with a streetcar which is about 20 feet shorter than an LRT vehicle and 66-foot radii curves that are designed for the LA streetcar. The issue of wheel squeal, if it occurs at this location, would be addressed during pre-revenue operations. This impact would be reduced to less than adverse by Mitigation Measure NV-O1 through installing a “low impact frog” at the 1st Street and Hill Street intersection and wheel dampers, if required.

**Maintenance and Storage Facility (MSF)**

The MSF would consist of an enclosed building for the maintenance shops and open area for storage. An employee parking lot may be provided. There is potential for the MSF to be housed in the ground floor of a multi-story development. When that happens all noisy activities associated with the MSF would be in enclosed spaces. However, the potential multi-story development is not part of this Project and the building may not be in place during the Opening Year. Therefore, for noise evaluation purposes the MSF was evaluated as a standard facility.

MSF-related sources of noise include carwashes, blowdown facilities, repair shops, vehicles movements across track switches, potential squeal noise from tight radius curves within the facility and vehicular traffic into and out of the facility. The MSF would likely have a single ingress/egress point for the streetcars at each of the potential sites although this would be determined during final design. The streetcars would access the facility via a short segment of track connected to the mainline by one or two turnout tracks. The streetcar would consist of a fleet of eight electrically powered streetcar vehicles. Each of the proposed sites for the MSF would have the capacity to store up to 12 vehicles.
The noise sources and the assumptions of the activities at the potential MSF sites are described below:

- **Traffic on Lead Tracks**: The number of streetcars entering and exiting the storage facility would peak during the hours starting at 6:00 a.m., 8:00 a.m., 3:00 p.m., and 5:00 p.m. These are hours when peak operations begin and end. For the 4 hours of peak activity between the main line and the MSF, the number of streetcars that would enter and exit the facility was assumed to be six. In addition, there is potential for the streetcars to enter and exit the facility when there are shift changes and/or streetcars are pulled out or fed into the mainline through the lead tracks. Therefore, we assumed the number of streetcars that would enter and exit the facility to be two during each hour when there is no peak activity.

- **Turnout tracks**: The turnout would be sources of impact noise from the wheel banging on the turnout frogs. The turnouts would experience difference amounts of traffic depending on their location. We assumed six streetcars would pass through the busiest turnout track during the peak hour.

- **Maintenance Shops**: Noise from the maintenance facility could include hammering for minor body work or repair of other components; noise from machines such as air compressor and metal working equipment; and noise from the HVAC system. Forklift backup alarms and general repair tools could also be intermittent noise sources. The maintenance shops are assumed to be a closed facility that would have its doors open most of the time. The noise contribution from the maintenance shop activities are assumed to be less than the yard activities.

- **Car Wash**: We assumed that the car wash would include one vehicle wash bay and servicing area for daily cleaning and would be a non-mechanical hand wash system at each of the MSFs.

- **Vehicular Traffic Into/Out of Facility**: A parking facility was assumed for site M1. For site M2, the existing parking garage on Olive Street was assumed to be used for parking. We assumed 5 peak hours and 4 off-peak hours for vehicle traffic into and outside the facility. The peak hour traffic assumes 10 motor vehicles during the peak and off-peak hours. In addition, 3 trucks were assumed during the peak hours. Based on the FHWA’s algorithm used in the Traffic Noise Model, the reference sound level at 50 feet for autos, SUVs and heavy trucks moving at 30 mph ranges from 65 to 77 dBA. We assumed a reference sound level (Leq) of 77 dBA at 50 feet for vehicles moving at 30 mph. This is a conservative reference level because at low speeds the vehicle noise is dominated by the engine noise, and not the tire-pavement noise.

Tables 4.11-5 and 4.11-6 show noise levels associated with the MSF sites. No impacts were identified other than at one location near the Broadway and 2nd Street site. A moderate impact would be expected to occur at the Guadalupe Wedding Chapel (Receiver I3) during the peak hours of operation without mitigation. The higher noise levels would be due to wheel squeal and turnout frog impacts in the storage yard. Rail lubrication for the tight radius tracks within the rail yard and the use of “low impact” frogs at the yard turnouts would reduce this impact to less than adverse (Mitigation Measure NV-02). This potential impact would be eliminated if the Guadalupe Wedding Chapel is acquired as part of the Broadway and 2nd Street MSF, which is yet to be determined.
Table 4.11-5. MSF Noise at Broadway and 2nd Street Site

<table>
<thead>
<tr>
<th>Activity</th>
<th>Potential Outdoor Noise Source(^a)</th>
<th>Estimated Ldn, dBA</th>
<th>Estimated Leq, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R1</td>
<td>R34</td>
</tr>
<tr>
<td>1</td>
<td>Train Movements on Shop and Yard Tracks</td>
<td>Shielded(^b)</td>
<td>49</td>
</tr>
<tr>
<td>1a. Main Line</td>
<td></td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>1b. Turnout frogs</td>
<td></td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>1c. Wheel squeal</td>
<td></td>
<td></td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>---</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>Vehicular Traffic Into/Out of Parking</td>
<td></td>
<td>24</td>
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<tr>
<td></td>
<td>Total MSF Noise</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Existing Noise Level (Ldn for R1, R34 and R35; Leq for I3)</td>
<td>76</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>FTA Threshold for Moderate Noise Impact</td>
<td>65</td>
<td>65</td>
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<td></td>
<td>Moderate Impact (Yes/No)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>FTA Threshold for Severe Noise Impact</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

\(^a\)A hand car wash is proposed at this MSF which is not a potential outdoor noise source.
\(^b\)Receiver R1 is shielded by Receiver I3.

Table 4.11-6. MSF Noise at 11th Street/Olive Street (East) Site

<table>
<thead>
<tr>
<th>Activity</th>
<th>Potential Outdoor Noise Source</th>
<th>Estimated Leq, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I8</td>
</tr>
<tr>
<td>1</td>
<td>Train Movements on Shop and Yard Tracks</td>
<td></td>
</tr>
<tr>
<td>1b. Turnout frogs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1c. Wheel squeal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1c. Closest source of wheel squeal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vehicular Traffic Into/Out of Parking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total MSF Noise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Existing Noise Level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FTA Threshold for Moderate Noise Impact</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Moderate Impact (Yes/No)</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>FTA Threshold for Severe Noise Impact</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Severe Impact (Yes/No)</td>
<td>No</td>
</tr>
</tbody>
</table>


Traction Power Substation (TPSS)

Regarding TPSS, cooling fans are the major noise source. However, low frequency transformer “hum” from such fans is usually inaudible except when a receptor is very close to the TPSS unit. It is common to include noise limits in the specifications for TPSS units to minimize the potential for noise impacts. The recommended limit is that the maximum noise level not exceed 50 dBA at a distance of 50 feet from any part of a TPSS unit. Table 4.11-7 includes a noise analysis for each potential TPSS location. The analysis demonstrates that TPSS units would not result in unacceptable noise levels. In addition, Mitigation Measure NV-O3 includes a noise limit of 50 dBA at a distance of 50 feet from any part of the TPSS unit, which would reduce this impact to less than adverse.
Table 4.11-7. TPSS Noise

<table>
<thead>
<tr>
<th>TPSS</th>
<th>Priority for Location</th>
<th>Address</th>
<th>Distance to Closest Receiver (Feet)</th>
<th>Receiver Category</th>
<th>Existing Noise Level (dBA)</th>
<th>Predicted Noise Level (dBA)</th>
<th>Impact?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Recommended</td>
<td>Within Public ROW</td>
<td>120</td>
<td>1</td>
<td>63</td>
<td>66</td>
<td>42 48</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>131 Olive St.</td>
<td>125</td>
<td>1</td>
<td>63</td>
<td>66</td>
<td>42 48</td>
</tr>
<tr>
<td>2</td>
<td>Recommended</td>
<td>208 Broadway</td>
<td>75</td>
<td>3</td>
<td>68</td>
<td>76</td>
<td>46 52</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>229 Broadway</td>
<td>40</td>
<td>3</td>
<td>68</td>
<td>76</td>
<td>52 58</td>
</tr>
<tr>
<td></td>
<td>Alternative/Temporary</td>
<td>213 Spring St.</td>
<td>200</td>
<td>3</td>
<td>68</td>
<td>76</td>
<td>42 53</td>
</tr>
<tr>
<td>3</td>
<td>Recommended</td>
<td>826 Broadway</td>
<td>25</td>
<td>2</td>
<td>68</td>
<td>76</td>
<td>56 62</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>913 Broadway</td>
<td>40</td>
<td>2</td>
<td>68</td>
<td>76</td>
<td>52 58</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>951 Broadway</td>
<td>40</td>
<td>2</td>
<td>68</td>
<td>76</td>
<td>52 58</td>
</tr>
<tr>
<td>4</td>
<td>Recommended</td>
<td>833 Flower St.</td>
<td>100</td>
<td>2</td>
<td>66</td>
<td>73</td>
<td>44 50</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>928 Figueroa St.</td>
<td>50</td>
<td>2</td>
<td>66</td>
<td>73</td>
<td>50 56</td>
</tr>
<tr>
<td>5</td>
<td>Recommended</td>
<td>431 Hill St.</td>
<td>100</td>
<td>2</td>
<td>59</td>
<td>66</td>
<td>44 50</td>
</tr>
<tr>
<td></td>
<td>Alternative</td>
<td>628 Hill St.</td>
<td>40</td>
<td>2</td>
<td>59</td>
<td>66</td>
<td>52 58</td>
</tr>
</tbody>
</table>


Vibration from Streetcar Operations

Effect NV-2: Vibration

Not Adverse with Mitigation. The approach for the vibration assessment was similar to the noise assessment. The primary differences are the following:

- An assessment of the propagation of vibration through the ground must be based on measurements, while the propagation of noise through air can be characterized using standard formulas.

- Existing vibration is not a consideration when assessing vibration impacts. This is because everyone is exposed to some audible environmental noise. However, it is relatively rare for people to be exposed to perceptible ground-borne vibration unless they are located near a construction site or near roadways with potholes, wide expansion joints, or other irregularities in the roadway surface.

Outdoor spaces are not considered sensitive to ground-borne vibration. In contrast, outdoor spaces where quiet is important for the intended function are considered noise sensitive. This includes spaces intended for meditation or study (e.g., cemeteries, monuments, historical spaces).

Table 4.11-8 shows the FTA general assessment criteria for ground-borne vibration from rail transit systems. Similar to the FTA noise criteria, there are three categories of sensitive land uses. However, the category definitions for vibration are different from those for noise. The primary difference is in Category 1. For a noise assessment, Category 1 applies to land uses “where quiet is an essential element of their intended purpose.”
Table 4.11-8. FTA Impact Thresholds for Ground-borne Vibration, General Impact Assessment

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Frequent Eventsa</th>
<th>Occasional Eventsb</th>
<th>Infrequent Eventsb</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Buildings where vibration would interfere with interior operations. Typically land uses include vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, and university research operations.d</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>2: Residences and buildings where people normally sleep.</td>
<td>72</td>
<td>75</td>
<td>80</td>
</tr>
<tr>
<td>3: Institutional land uses with primarily daytime use.</td>
<td>75</td>
<td>78</td>
<td>83</td>
</tr>
</tbody>
</table>


a Frequent events are defined as more than 70 vibration events per day.
b Occasional events are defined as 30 to 70 events per day.
c Infrequent events are defined as less than 30 events per day.
d Vibration-sensitive equipment is not sensitive to ground-borne noise.

For a vibration assessment, Category 1 applies to “buildings where vibration would interfere with interior operations.” This applies primarily to spaces that house sensitive research and laboratory equipment, such as scanning electron microscopes. There are no buildings in the project corridor that qualify as Category 1 vibration-sensitive land uses.

Unlike the FTA noise criteria, the vibration criteria do not incorporate any factor to account for the number of vibration events per day, with one exception. For “occasional service,” the FTA impact thresholds are 3 velocity decibels (VdB) higher than they are for “frequent service.” For “infrequent service,” the FTA impact thresholds are 8 VdB higher than they are for “frequent service.” The frequent service criteria is applicable to the Project because there would be more than 70 streetcar trips per day.

The FTA vibration thresholds do not specifically account for existing vibration. Although downtown Los Angeles has substantial volumes of vehicular traffic, including buses and trucks, it is relatively rare for rubber-tired vehicles to generate perceptible ground vibration, unless irregularities in the roadway surface, such as potholes, are present.

Some buildings, such as concert halls, recording studios, and theaters, can be very sensitive to vibration; however, they do not fit the three categories listed in Table 4.11-8. Because of the sensitivity of these buildings, they usually warrant more detailed vibration assessment during the environmental evaluation of a transit project. Table 4.11-9 lists the FTA criteria concerning acceptable levels of ground-borne noise and vibration for the various categories of “special” buildings. The five theaters on Broadway as well as the Belasco Theater on 11th Street were categorized as “special” buildings in the project corridor.
The Belasco Theater was evaluated as a concert hall. The Orpheum Theater was evaluated as a TV recording facility/performance space. The Million Dollar Theater and the Los Angeles Theater are currently unoccupied but could be revived in the future. The theaters would undergo their own noise studies prior to renovation. The United Artist Theater was recently renovated and reopened. For the purpose of this analysis, these three theaters were evaluated as concert halls. The FTA thresholds pertaining to ground-borne noise and vibration impact assessments for various "special" buildings are listed in Table 4.11-10. Potential effects to the Disney Concert Hall, the Dorothy Chandler Pavilion, and the Colburn School are discussed under the analysis for the Grand Avenue Extension Design Option, which is located below in Section 4.11.3.2.1.

The streetcar vibration impact analysis is based on the FTA Guidance Manual. Potential vibration impacts were assessed for streetcar operations. Key points from the impact assessment are as follows:

- It is assumed that vibration generated by operation of the streetcar vehicles in downtown Los Angeles would be similar to what was observed for the modern streetcar systems in other cities.
- It is assumed that the maximum speed for the streetcars would be 30 mph on Figueroa Street and 25 mph on the rest of the alignment. The speed would be 20 mph as the streetcars approach stations and stops.
- The ground propagation characteristics used for the predictions are based on four vibration propagation tests that were made in the project corridor. Three of the test sites were at theaters or concert halls. The fourth test site was a parking lot on 9th Street.

The streetcar operational vibration impact assessment for residential land uses is presented in Table 4.11-10. There are two receivers (R22 and R35) where the predicted vibration levels at residential land uses would exceed the General Assessment impact threshold. The predicted indoor vibration levels, however, would not exceed the Detailed Assessment impact threshold at any of these receivers. Therefore, no vibration impacts from the streetcar operations are predicted at any Category 2 land uses.
### Table 4.11-10. Summary of Vibration Impact Assessment for Category 2 Residential Land Uses

<table>
<thead>
<tr>
<th>Receiver</th>
<th>Desc.</th>
<th>NT Dist.</th>
<th>Adjacent Street</th>
<th>Speed (mph)</th>
<th>General Impact Assessment</th>
<th>Detailed Impact Assessment</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(feet)</td>
<td></td>
<td></td>
<td>Lv (VdB)</td>
<td>Thresh. (VdB)</td>
<td>Impact (Yes/No)</td>
</tr>
<tr>
<td>R1</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>20</td>
<td>69</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R2</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>20</td>
<td>65</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R3</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>20</td>
<td>69</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R4</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>25</td>
<td>67</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R5</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>20</td>
<td>66</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R6</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R7</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R8</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>20</td>
<td>69</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R9</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>25</td>
<td>67</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R10</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>20</td>
<td>66</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R11</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>20</td>
<td>66</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R12</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>20</td>
<td>66</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R13</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R14</td>
<td>Hotel</td>
<td>50</td>
<td>Broadway</td>
<td>25</td>
<td>67</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R15</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>20</td>
<td>66</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R16</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R17</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>20</td>
<td>66</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R18</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>20</td>
<td>66</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R19</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R19A</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R20</td>
<td>MFR</td>
<td>50</td>
<td>Broadway</td>
<td>25</td>
<td>67</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R21</td>
<td>MFR</td>
<td>35</td>
<td>Broadway</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R22</td>
<td>MFR</td>
<td>25</td>
<td>11th</td>
<td>25</td>
<td>73</td>
<td>72</td>
<td>Yes</td>
</tr>
<tr>
<td>R23</td>
<td>MFR</td>
<td>25</td>
<td>11th</td>
<td>20</td>
<td>72</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R24</td>
<td>MFR</td>
<td>30</td>
<td>11th</td>
<td>25</td>
<td>72</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R25</td>
<td>Hotel</td>
<td>45</td>
<td>Figueroa</td>
<td>35</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R26</td>
<td>Hotel</td>
<td>45</td>
<td>Figueroa</td>
<td>35</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R27</td>
<td>MFR</td>
<td>40</td>
<td>Figueroa</td>
<td>25</td>
<td>69</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R28</td>
<td>MFR</td>
<td>40</td>
<td>Figueroa</td>
<td>35</td>
<td>72</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R32</td>
<td>MFR</td>
<td>45</td>
<td>Hill</td>
<td>25</td>
<td>68</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R33</td>
<td>MFR</td>
<td>45</td>
<td>Hill</td>
<td>25</td>
<td>68</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R34</td>
<td>MFR</td>
<td>50</td>
<td>Hill</td>
<td>25</td>
<td>62</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R35</td>
<td>Hotel</td>
<td>25</td>
<td>Hill</td>
<td>25</td>
<td>73</td>
<td>72</td>
<td>Yes</td>
</tr>
<tr>
<td>R29</td>
<td>Hotel</td>
<td>125</td>
<td>7th</td>
<td>20</td>
<td>54</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R30</td>
<td>Hotel</td>
<td>35</td>
<td>7th</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
<tr>
<td>R31</td>
<td>MFR</td>
<td>35</td>
<td>7th</td>
<td>25</td>
<td>71</td>
<td>72</td>
<td>No</td>
</tr>
</tbody>
</table>


*Desc. = Type of land use, MFR = multi-family residence.

* NT Dist. = Distance to the streetcar track is rounded off to the nearest 5 feet.

* Maximum 1/3 octave band level in 8 to 80 Hz frequency range.

* Number of impacted dwelling units based on Detailed Assessment vibration criteria. Note that only units that are within the impact distance and where people sleep are counted for the vibration impacts.
The predicted vibration levels for Category 3 land uses are shown in Table 4.11-11. All of the predicted vibration levels except for the Federal Courthouse would be below the General Assessment impact threshold. The predicted indoor vibration levels would not exceed the Detailed Assessment impact threshold at the Federal Courthouse; therefore, no vibration impacts from streetcar operations are predicted at any Category 3 land uses.

Table 4.11-11. Summary of Vibration Impact Assessment for Category 3 Institutional Land Uses

<table>
<thead>
<tr>
<th>Receiver #</th>
<th>Receiver Name</th>
<th>NT Dist.a (feet)</th>
<th>Speed (mph)</th>
<th>General Impact Assessment</th>
<th>Detailed Impact Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>Mosk Courthouse</td>
<td>50</td>
<td>25</td>
<td>67.c,d</td>
<td>75</td>
</tr>
<tr>
<td>I2</td>
<td>LA Law Library</td>
<td>125</td>
<td>20</td>
<td>64</td>
<td>75</td>
</tr>
<tr>
<td>I2A</td>
<td>Federal Courthouse</td>
<td>30</td>
<td>20</td>
<td>82</td>
<td>80</td>
</tr>
<tr>
<td>I3</td>
<td>Guadalupe Wedding Chapel</td>
<td>35</td>
<td>25</td>
<td>71</td>
<td>75</td>
</tr>
<tr>
<td>I4</td>
<td>Optometrist</td>
<td>35</td>
<td>20</td>
<td>69</td>
<td>75</td>
</tr>
<tr>
<td>I5</td>
<td>Clinic</td>
<td>50</td>
<td>20</td>
<td>66</td>
<td>75</td>
</tr>
<tr>
<td>I6</td>
<td>Universal Church (Formerly the State Theater)</td>
<td>35</td>
<td>25</td>
<td>71</td>
<td>75</td>
</tr>
<tr>
<td>I7</td>
<td>Optometrist</td>
<td>50</td>
<td>20</td>
<td>66</td>
<td>75</td>
</tr>
<tr>
<td>I8</td>
<td>SIATech School</td>
<td>30</td>
<td>25</td>
<td>72</td>
<td>75</td>
</tr>
<tr>
<td>I9</td>
<td>YWCA Job Corps &amp; SIATech School</td>
<td>30</td>
<td>20</td>
<td>70</td>
<td>75</td>
</tr>
<tr>
<td>I10</td>
<td>Grammy Museum</td>
<td>90</td>
<td>25</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>I11</td>
<td>Pershing Square</td>
<td>50</td>
<td>25</td>
<td>67</td>
<td>75</td>
</tr>
<tr>
<td>I12</td>
<td>Angels Knoll Park</td>
<td>70</td>
<td>25</td>
<td>64</td>
<td>75</td>
</tr>
</tbody>
</table>


- **a** Distance to the near track (NT) is rounded off to the nearest 5 feet.
- **b** Maximum 1/3 octave band level in 8 to 80 Hz frequency range.
- **c** Includes both inbound and outbound tracks.
- **d** Includes +10 dB for vibration amplification due to wheel impacts at special trackwork.

Table 4.11-12 shows no ground-borne noise or ground-borne vibration impacts are predicted at buildings that FTA defines as “special.” However, the potential exists for vibration to be transmitted into structures because of the number of underground structures in the project area, such as basements, loading docks, and parking garages. This includes the currently unoccupied Million Dollar Theater, Los Angeles Theater, and the United Artist Theater (recently renovated and opened as part of the Ace Hotel). The results of the four vibration tests for the current Project, although comparable, indicate that vibration propagation paths in the downtown area are not just in soil but in the numerous underground structures, the transmission efficiencies of which are not sufficiently straightforward to predict. Performing site-specific tests at these sensitive spaces will verify whether streetcar operations could result in vibration impacts inside sensitive spaces and require suitable mitigation to be designed. Mitigation measures, such as a resilient mat to break the direct connection, could be required if the track would be less than 1 foot from any part of a building foundation. Mitigation Measure **NV-O4** would reduce operational vibration impacts to less-than-adverse.
Table 4.11-12. Summary of Vibration Impact Assessment for “Special” Buildings

<table>
<thead>
<tr>
<th>Receiver #</th>
<th>Receiver Name</th>
<th>Location</th>
<th>Groundborne Vibration, VdB</th>
<th>Groundborne Noise, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Threshold</td>
<td>Predicted Impacts</td>
</tr>
<tr>
<td>T1</td>
<td>Colburn School</td>
<td>Indoors</td>
<td>65</td>
<td>41&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>T2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Disney Concert Hall</td>
<td>BP Hall</td>
<td>65</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concert Hall</td>
<td>65</td>
<td>53</td>
</tr>
<tr>
<td>T5</td>
<td>Orpheum Theater</td>
<td>Seat X-40</td>
<td>65</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seat V-2</td>
<td>65</td>
<td>50</td>
</tr>
<tr>
<td>T7</td>
<td>Belasco Theater</td>
<td>Off Stage</td>
<td>65</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Stage</td>
<td>65</td>
<td>64</td>
</tr>
<tr>
<td>T8&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Dorothy Chandler Pavilion</td>
<td>Indoors</td>
<td>65</td>
<td>49&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

THEATERS ON BROADWAY

<table>
<thead>
<tr>
<th>Receiver #</th>
<th>Receiver Name</th>
<th>Location</th>
<th>Groundborne Vibration, VdB</th>
<th>Groundborne Noise, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Threshold</td>
<td>Predicted Impacts</td>
</tr>
<tr>
<td>T3</td>
<td>Million Dollar Theater</td>
<td>Performance Space</td>
<td>65</td>
<td>54&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>T4</td>
<td>Los Angeles Theater</td>
<td>Performance Space</td>
<td>65</td>
<td>54&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>T6</td>
<td>United Artist Theater</td>
<td>Performance Space</td>
<td>65</td>
<td>54&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>


<sup>a</sup> The predictions are based on LSTM measured at the Disney Concert Hall.

<sup>b</sup> The estimates are based on measurements in the Orpheum Theater and not on site-specific tests at these receivers.

<sup>c</sup> The results need to be confirmed during Final Design.

<sup>d</sup> Receivers T1, T2, and T8 are along the Grand Avenue Extension Design Option alignment.

4.11.3.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would potentially affect additional sensitive land uses, including the Disney Concert Hall, the Dorothy Chandler Pavilion, or the Colburn School. Adverse noise effects were not identified at the Dorothy Chandler Pavilion, the Colburn School, or inside the Disney Concert Hall. However, as shown in Table 4.11-12, a moderate impact is predicted outside the Disney Concert Hall. The sources of streetcar noise impacts outside the Disney Concert Hall are the combination of: 1) wheel impacts at special trackwork and 2) potential squeal noise from tight curves located on Grand Avenue and 1st Street. The use of a “low impact” frog at the special trackwork would reduce the wheel impact noise. Use of one of several rail lubricants is usually sufficient to control wheel squeal. However, because of the steep grade of the track there is concern with the use of a lubricant at this location. The FTA Guidance Manual discusses wheel squeal from LRT vehicles and not from streetcars. It is less likely that wheel squeal would occur with a streetcar which is about 20 feet shorter than an LRT vehicle and 66-foot radii curves that are designed for the Los Angeles streetcar. The issue of wheel squeal, if it occurs at this location, would be addressed during pre-revenue operations. If it does occur the use of wheel dampers would control the wheel squeal without using a lubricant. This impact would be reduced to less than adverse by Mitigation Measure NV-O1, through installing a “low impact frog” at the 1st Street and
Hill Street intersection and wheel dampers. Therefore, implementation of the Grand Avenue Extension Design Option would not result in an adverse effect related to noise.

Regarding vibration, the Disney Concert Hall and the Dorothy Chandler Pavilion are categorized as “special” buildings in the project corridor. The Colburn School is a performance space and a music conservatory with recording facilities. This school was evaluated as a recording facility. The Disney Concert Hall was evaluated as a concert hall. The Dorothy Chandler Pavilion is far enough from the streetcar alignment that it would not be affected by streetcar operation. As shown in Table 4.11-12, no ground-borne noise or ground-borne vibration impacts were identified at the Disney Concert Hall or the Colburn School. Therefore, implementation of the Grand Avenue Extension Design Option would not result in an adverse effect related to vibration.

4.11.4 Measures to Minimize Harm

**NV-O1:** At vicinity of Disney Concert Hall; the contractor shall install a “low impact” frog, such as a “well designed” flange bearing frog with a ramp angle between 1:20 and 1:100, for special trackwork as well as wheel dampers if wheel squeal occurs. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-O2:** The contractor shall use a “low impact” frog, such as a “well designed” flange bearing frog with a ramp angle between 1:20 and 1:100, for all special trackwork within the MSF. Rail lubricators shall be installed at all tight radius curves within the MSF to reduce and control wheel squeal. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-O3:** During pre-revenue testing, noise measurements shall be taken at the TPSS units to confirm compliance with the Contract Specification noise level limit of 50 dBA at 50 feet from any side of the TPSS unit. Should exceedances of the noise level limit be found to occur, mitigation options shall be identified and considered, including housing shielding or other suitable methods.

**NV-O4:** If the track would be less than 1 foot from any part of a building foundation, mitigation measures, such as a resilient mat installed under the trackbed or comparable design measure, would be used. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

4.12 Safety and Security

This section presents information about existing safety and security, especially as it pertains to pedestrians, motorists, and communities that may be impacted by the Project.

4.12.1 Affected Environment

Both federal and state regulatory requirements emphasize safety aspects in the development of new facilities and systems. Federal requirements include those published by the Federal Railroad Administration (FRA), FHWA, and FTA. NEPA mandates that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 U.S.C. 4331(b)(2)). FHWA, in its implementation of NEPA
(23 USC 109(h)), directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, including whether a project or a design option would result in unacceptable safety or operational problems. Relevant federal regulations include the Public Transportation Safety Act of 2010, the Moving Ahead for Progress in the 21st Century law, and the FTA State Safety Oversight Rule.

At the state level, the California Public Utilities Commission (CPUC) has regulatory and safety oversight pertaining to railroads and rail transit systems in the state. The commission, which coordinates with FRA and FTA, is the largest participating state agency in the nation for ensuring railroad compliance with federal railroad safety regulations resulting from the Federal Railroad Safety Act of 1970, as codified in Part 49 of the CFR.

Locally, the Los Angeles Police Department (LAPD) has primary jurisdiction in the downtown Los Angeles area. However, the Transit Services Bureau of the Los Angeles Sherriff Department (LASD) would provide contract police services for the Project. At present, the Transit Services Bureau provides transit-related security for Metro and LADOT’s DASH and Commuter Express services. With respect to fire and other emergency services, the Project would be served by Los Angeles Fire Department (LAFD) Division 1, Battalion 1, at Station No. 3, located at 108 North Fremont Avenue, approximately 0.4 mile west of the build alternative alignments. Personnel from other stations would be available to assist as needed.

4.12.2 Environmental Consequences

4.12.2.1 No Build Alternative

Not Adverse. Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.

4.12.2.2 7th Street Alignment Alternative

Effect SAFE-1: Safety

Substantially Reduced with Mitigation. Downtown Los Angeles is a controlled street system with traffic signals and crosswalks at intersections. In some instances, mid-block crosswalks are provided to further promote pedestrian safety. Nonetheless, the potential exists for streetcar conflicts with vehicles, pedestrians, and bicycles safety. These concerns are further addressed below.

Streetcar operators would undergo specialized safety training related to operating vehicles in mixed-flow traffic. The training would be similar to that required for bus operators. It is standard practice for the City to incorporate related language into O & M contracts associated with vehicle operations (e.g., bus fleets). In addition, the Project would comply with all safety and inspection requirements mandated by federal and state agencies.

Regarding vehicle safety, streetcar vehicles are unable to make lateral movements because of the fixed guideway, which reduces the ability of the operators to avoid hazards, such as vehicles, pedestrians, bicycles, or debris in the roadway. However, operating speeds would be the same as or
slower than adjacent traffic, owing to the relatively short distances between stops and the presence of numerous traffic lights along the Project alignment. In addition, the streetcars would have a braking system that would be capable of bringing the vehicles to a stop within distances comparable to buses. Streetcar vehicles would be equipped with audible warning devices, a train-to-wayside communication system, and signs for safety and wayfinding. Furthermore, operators would undergo extensive training and continuing evaluation to ensure the safety of streetcar operations. Transit safety programs would be implemented with the goal of raising streetcar safety awareness in the community. Consequently, risks related to vehicular collisions are not anticipated to increase under the Project.

Regarding pedestrian safety, streetcars would operate in mixed-flow traffic, traveling in the same direction as other motor vehicles and stopping at designated stops along the route. The streetcar vehicles would operate at speeds no greater than the posted speed limits. Except for the fact that the streetcars would run on a fixed guideway and electricity would be supplied by an OCS, operation of the Project would be similar to the operation of local buses. Platforms would be located adjacent to the sidewalk under the Project, although the Grand Avenue Extension would include a platform in the center of Grand Avenue. Pedestrian access to the streetcar would be either from a curbside location or a median platform reached from a mid-block crosswalk. Following the construction period, there would be no impediments to pedestrians because sidewalks and crosswalks would not be obstructed.

Regarding bicycle safety, the Project would involve the installation of a fixed rail guideway within the roadway, which may present hazards for cyclists traveling parallel to, or across, the railway. Although the rail itself would be vertically flush with the road surface, there would be a horizontal gap between the track and the surrounding pavement, which is known as the “flangeway.” The flangeway may be wider than the width of a typical bicycle tire, particularly the tires used on road bicycles, and therefore bicycle tires can be caught in the flangeway if the bicycle is traveling too close to and parallel, or close to parallel, to the flangeway. Bicycles crossing the rails at right angles (or similar) would not experience this problem. This “tire in-track” issue would be a potential hazard for bicyclists using streets where: (a) the streetcar would be travelling in the right-hand curb lane and (b) also would not have existing or planned separated bicycle lanes. These streets would include Broadway (from 1st to 11th Streets) and Hill Street (from 4th to 1st Streets). In all instances in which the fixed guideway would occupy the same roadway as an existing or planned bike lane (and cyclists would be traveling parallel to the fixed guideway), designated bike lanes and the guideway would be sufficiently separated to alleviate this potential issue. Roadways with bicycle lanes are expected to experience the highest volume of cyclists, but implementation of the Project would not prohibit cyclists from using any part of the alignment, in accordance with the California Vehicle Code (Article 4; par. 12202 & 21208).

The implementation of safety measures related to vehicles and pedestrians render safety impacts for these groups not adverse. Safety hazards for cyclists would be substantially reduced with the implementation of Mitigation Measure TRAF-01, which includes signage, pavement markings instructing cyclists how to cross tracks safely, along with additional safety measures aimed specifically at cyclists. Even with the implementation of Mitigation Measure TRAF-01, however, safety impacts to cyclists are still considered moderately adverse, though due to mitigation they are not considered adverse impacts.
Effect SAFE-2: Accessibility

Not Adverse. Regarding accessibility, platforms would be located adjacent to the sidewalk under the Project, although the Grand Avenue Extension would include a platform in the center of Grand Avenue. Platforms would be 8 to 14 inches high to match, or nearly match, the floor height of the streetcar vehicles. Lateral gaps between the curb and the vehicles would be small to allow those with wheelchairs and other mobility devices to board without difficulty. Vehicles would be designed to be fully ADA compliant and associated regulations and guidance. Therefore, no adverse effect related to accessibility would occur.

Effect SAFE-3: Emergency Response

Not Adverse. The Project would not require a new or revised emergency response plan, nor interfere with adopted plans. Emergency responders would travel along the roadways as the location of the emergency dictates. The Project would be served by the LAFD, LAPD, and the LASD. LAFD Division 1, Battalion 1, at Station No. 3 and LAPD Central Division, Central Community Police Station. LASD’s Transit Services Bureau would provide contract police service and would be capable of responding to security-related emergencies along the Project alignment. The grid-like layout of the downtown Los Angeles area provides emergency responders with the flexibility to travel to the scene of an emergency from multiple routes, allowing them to bypass known congested intersections. Although roadways are projected to be more congested under future conditions, emergency vehicles will continue to use the roadways to reach the scene of an emergency. It is anticipated emergency responders would be readily available to respond to incidents involving the streetcar system. Therefore, the Project would not result in an adverse effect related to emergency response.

Effect SAFE-4: Security

Not Adverse. The Project would operate in downtown Los Angeles, a highly urbanized area where crime is a fact of urban life and will continue with or without implementation of the Project. The contribution of the Project to any increase in crime that may occur in the future would be negligible. There would be few changes in the operational characteristics of the transportation right-of-way and adjacent areas as a result of Project implementation. All riders would be subject to the LADOT Rider’s Code of Conduct. Personnel from the Transit Services Bureau of LASD would respond in the event of a security-related emergency, with assistance provided by LAPD as necessary. The MSF, TPSS units, and OCS would all be secured to prevent trespassing and tampering. In addition, stations would be well lit to provide security at night. Therefore, the Project would not result in an adverse effect related to security.

4.12.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would result in the streetcar running along 1st Street and Grand Avenue. The platform would be located in the center of Grand Avenue. The Project analysis presented above is applicable to the Grand Avenue Extension, although the center platform would require new curb cuts to accommodate crosswalks and ramps for ADA compliance. Safety hazards for cyclists on 1st Street and Grand Avenue would be substantially reduced with the implementation of TRAF-O1, which includes signage, pavement markings instructing cyclists how to cross tracks safely and other potential safety measures. Similar to as discussed above for the Project, implementation of the Grand Avenue Extension would not result in an adverse effect related to vehicle or pedestrian safety, accessibility, emergency response, or security.
4.12.3 Measures to Minimize Harm

TRAF-O1: Mitigation to be considered would include:

- Signage and pavement markings to alert bicyclists to the presence of streetcar tracks.
- Instruct cyclists to cross tracks perpendicular to the direction of the rails. For left-turning cyclists, pavement markings shall be provided to encourage perpendicular bicycle turning movements, such as "Copenhagen Left" turns. The signage and/or pavement markings would also clearly identify the presence of the flangeway to cyclists traveling parallel to the fixed guideway.
- Alert bicyclists to use parallel bike routes (or Class II bike facilities) where available, such as Spring Street as an alternative to southbound Broadway.
- Recommend alternate routes.

4.13 Transportation and Traffic

This section describes the potential for effects related to transportation and traffic. The information presented in this section is based on the Transportation Technical Study and the Vehicle Miles Traveled Technical Memorandum, which are included as Appendix I. The affected environment and environmental consequences are summarized below.

4.13.1 Affected Environment

There are no federal or state regulations that outline quantitative measures with which the Project must comply because such standards are set at a local or regional level for roadways that are not under the state or federal highway systems. With respect to rail safety, the CPUC Rail Transit Safety Section prescribes requirements for the design, construction, operation, and maintenance of heavy rail transit, light rail transit, trolleys, and funicular systems. CPUC ensures that all rail transit system extensions and new construction projects undergo a safety certification review and receive approval.

The City’s Mobility Plan 2035 (City of Los Angeles 2016a) incorporates “Complete Streets” principles, and lays the policy foundation for how future City of Los Angeles generations will interact with streets. The "Complete Streets" concept takes into account the many community needs that streets fulfill. The plan identifies goals, objectives, policies and action items (programs and projects that serve as guiding tools for making sound transportation decisions). The 2010 Bicycle Plan is a component of the Mobility Plan 2035.

LADOT publishes the Traffic Study Policies and Procedures, which establishes traffic impact significance thresholds to determine a project’s impacts on the operational efficiency of intersections and roadway/freeway segments (City of Los Angeles 2014).

4 A Copenhagen Left turn is a two-staged left turn wherein the bicyclist crosses the intersection ahead, stops on the opposite side in the direction he/she wishes to turn, awaits a green light, and crosses the intersection to complete the left turn.
The study area for the purposes of this section is defined by the 65 key signalized study intersections shown in Figure 4.13-1. Study area intersections were identified in coordination with, and approved by, LADOT. The study area intersections are located along the streetcar alignment and adjacent parallel streets that are one block away from the alignment. The intersections along these parallel streets were included to capture potential traffic diversions that may occur due to the reduction in roadway capacity along the alignment and the proposed turn restrictions along Broadway that would result from implementation of the BSMP and also other programmed public improvement projects.

The study area includes the north–south arterials between and including 1st Street and 11th Street, and the east–west arterials between and including Figueroa and Spring Streets. Table 4.13-1 provides information about the arterials in the study area.

### Table 4.13-1. Arterials in the Study Area

<table>
<thead>
<tr>
<th>Arterial</th>
<th>Roadway Type</th>
<th>Direction of Travel</th>
<th>Vehicles per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figueroa Street</td>
<td>Modified Avenue I</td>
<td>North and South</td>
<td>19,300 to 32,100</td>
</tr>
<tr>
<td>Flower Street</td>
<td>Modified Avenue II</td>
<td>North and South</td>
<td>6,700 to 17,600</td>
</tr>
<tr>
<td>Grand Avenue</td>
<td>Modified Avenue II</td>
<td>North and South</td>
<td>12,300 to 22,500</td>
</tr>
<tr>
<td>Olive Street</td>
<td>Modified Avenue II</td>
<td>North and South</td>
<td>13,300 to 17,300</td>
</tr>
<tr>
<td>Hill Street</td>
<td>Modified Avenue II</td>
<td>North and South</td>
<td>18,200 to 22,100</td>
</tr>
<tr>
<td>Broadway</td>
<td>Modified Avenue II</td>
<td>North and South</td>
<td>15,500 to 19,800</td>
</tr>
<tr>
<td>Spring Street</td>
<td>Modified Avenue II</td>
<td>South</td>
<td>14,500 to 17,800</td>
</tr>
<tr>
<td>1st Street</td>
<td>Modified Boulevard II</td>
<td>East and West</td>
<td>14,000 to 23,300</td>
</tr>
<tr>
<td>2nd Street</td>
<td>Modified Avenue III</td>
<td>East and West</td>
<td>11,700 to 17,100</td>
</tr>
<tr>
<td>3rd Street</td>
<td>Modified Avenue III</td>
<td>West</td>
<td>17,800 to 20,800</td>
</tr>
<tr>
<td>4th Street</td>
<td>Modified Avenue III</td>
<td>East</td>
<td>11,500 to 12,700</td>
</tr>
<tr>
<td>5th Street</td>
<td>Modified Avenue III</td>
<td>West</td>
<td>21,200 to 22,200</td>
</tr>
<tr>
<td>6th Street</td>
<td>Modified Avenue III</td>
<td>East</td>
<td>14,100 to 21,000</td>
</tr>
<tr>
<td>7th Street</td>
<td>Modified Avenue II</td>
<td>East and West</td>
<td>16,700 to 19,700</td>
</tr>
<tr>
<td>8th Street</td>
<td>Modified Avenue III</td>
<td>West</td>
<td>12,500 to 15,300</td>
</tr>
<tr>
<td>9th Street</td>
<td>Modified Avenue II</td>
<td>East</td>
<td>13,400 to 21,600</td>
</tr>
<tr>
<td>Olympic Boulevard</td>
<td>Modified Avenue I</td>
<td>East and West</td>
<td>20,400 to 32,400</td>
</tr>
<tr>
<td>11th Street</td>
<td>Modified Avenue III</td>
<td>West</td>
<td>4,600 to 10,400</td>
</tr>
</tbody>
</table>

Source: Transportation Technical Study (Appendix I).

Level of Service (LOS) is a scale used to determine the operational efficiency of intersections based on average delay experienced by vehicles. The levels range from A to F, with LOS A representing free-flowing traffic and LOS F representing severe traffic congestion. Intersections with LOS E are considered to have poor conditions with an average delay of 55 to 80 seconds, and may have long lines of waiting vehicles through several signal cycles. When traffic delays are greater than 80 seconds, operations are designated as LOS F and could have backups from nearby locations or on cross streets that may restrict or prevent movement of vehicles out of the intersection approaches.
Figure 4.13-1. Study Area Intersections
The vast majority (62) of the 65 study area intersections under existing conditions perform at LOS D or better during both AM and PM peak hours. However, during the AM peak hour, the Broadway/3rd Street intersection operates at LOS F and the Figueroa Street/Olympic Boulevard intersection operates at LOS E. During the PM peak hour, the Olive Street/9th Street intersection performs at LOS F and the Figueroa Street/Olympic Boulevard intersection performs at LOS E. Appendix I shows the LOS values and estimated delays for all 65 study area intersections.

The downtown area has the highest concentration of transit service of any area in Los Angeles County. At present, ten transit operators provide service within the downtown area, with the bulk of service provided by Metro. The downtown Los Angeles area currently has several bicycle facilities in the form of Class II bike lanes and Class III bike routes. In addition, future development of the network of bicycle facilities in the area is planned, as specified in the Mobility Plan 2035.

Table 4.13-2 shows the existing and proposed bicycle facilities that would interface with the Project, either by sharing or crossing its alignment. Pedestrians circulate the study area via sidewalks, signalized crosswalks, and a small number of off-street paths, such as pedestrian bridges. The central downtown area experiences heavy pedestrian traffic on weekdays, particularly during the commute and lunch hours. Pedestrian activity is generally concentrated in areas with dense daytime employment, such as Bunker Hill, the Financial District, and the Historic Core. Some pedestrian activity occurs between the Civic Center and Little Tokyo along 1st and 2nd Streets.

Street segments were surveyed in 2013 to identify the existing number of on-street parking and loading spaces and associated peak period parking restriction information. The survey identified 367 spaces along the Project alignment and 372 spaces with the Grand Avenue Extension. With respect to the potential MSF sites, the Broadway and 2nd Street MSF has approximately 240 off-street parking spaces and the 11th Street and Olive Street MSF has approximately 140 off-street parking spaces.

### 4.13.2 Environmental Consequences

#### 4.13.2.1 No Build Alternative

**Not Adverse.** Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.

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5 According to the *California Streets and Highway Code* Section 890.4, a Class II Bikeway (Bike Lane) provides a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and crossflows by pedestrians and motorists permitted. A Class III Bikeway (Bike Route) provides a right-of-way on-street or off-street, designated by signs or permanent markings, and is shared with pedestrians and motorists.
Table 4.13-2. Existing and Proposed Bicycle Facilities in the Study Area

<table>
<thead>
<tr>
<th>Segment</th>
<th>From</th>
<th>To</th>
<th>Miles within Downtown Area</th>
<th>Facility Type</th>
<th>Existing/Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Figueroa St.</td>
<td>Olympic Blvd.</td>
<td>I-10</td>
<td>0.66</td>
<td>Bike Route (Class III)</td>
<td>Existing</td>
</tr>
<tr>
<td>S. Grand Ave.</td>
<td>7th St.</td>
<td>I-10</td>
<td>1.06</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>S. Olive St.</td>
<td>7th St.</td>
<td>I-10</td>
<td>1.05</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>1st St.</td>
<td>I-110</td>
<td>San Pedro St.</td>
<td>0.91</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>7th St.</td>
<td>I-110</td>
<td>Main St.</td>
<td>0.78</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>7th St.</td>
<td>Central Ave.</td>
<td>I-110</td>
<td>1.53</td>
<td>Buffered Bike Lane</td>
<td>Proposed</td>
</tr>
<tr>
<td>Figueroa St.</td>
<td>US-101</td>
<td>Wilshire Blvd.</td>
<td>1.00</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>Figueroa St.</td>
<td>I-10</td>
<td>7th St.</td>
<td>1.04</td>
<td>Buffered Bike Lane</td>
<td>Proposed</td>
</tr>
<tr>
<td>2nd St.</td>
<td>I-110</td>
<td>Spring St.</td>
<td>0.71</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>Spring St.</td>
<td>US-101</td>
<td>Main St.</td>
<td>1.30</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>Main St.</td>
<td>US-101</td>
<td>I-10</td>
<td>2.00</td>
<td>Bike Lane (Class II)</td>
<td>Existing</td>
</tr>
<tr>
<td>Flower St.</td>
<td>2nd St.</td>
<td>I-10</td>
<td>1.55</td>
<td>Bike Lane (Class II)</td>
<td>Proposed</td>
</tr>
<tr>
<td>Hope St.</td>
<td>6th St.</td>
<td>Pico Blvd.</td>
<td>0.87</td>
<td>Bike Friendly St. (Class III)</td>
<td>Proposed</td>
</tr>
<tr>
<td>Hill St.</td>
<td>4th St.</td>
<td>I-10</td>
<td>1.42</td>
<td>Bike Lane (Class II)</td>
<td>Proposed</td>
</tr>
<tr>
<td>11th St.</td>
<td>Main St.</td>
<td>Figueroa St.</td>
<td>0.52</td>
<td>Buffered Bike Lane</td>
<td>Proposed</td>
</tr>
<tr>
<td>Spring St.</td>
<td>9th St.</td>
<td>Cesar E Chavez Ave.</td>
<td>1.44</td>
<td>Buffered Bike Lane</td>
<td>Proposed</td>
</tr>
<tr>
<td>Main St.</td>
<td>9th St.</td>
<td>Cesar E Chavez Ave.</td>
<td>1.5</td>
<td>Buffered Bike Lane</td>
<td>Existing</td>
</tr>
<tr>
<td>Los Angeles St.</td>
<td>E. 1st St.</td>
<td>North Alameda St./Union Station Driveway</td>
<td>0.47</td>
<td>Buffered Bike Lane</td>
<td>Existing</td>
</tr>
</tbody>
</table>

Source: City of Los Angeles Active Transportation GIS map 2016.

4.13.2.2 7th Street Alignment Alternative

**Effect TRAF-1: Operational Traffic**

*Not Adverse.* Weekday traffic volume counts were collected at the 65 study intersections during typical morning and afternoon peak commute periods pursuant to LADOT guidelines, which recommend that counts be collected on days with good weather, on days when schools are in session, and during weeks without a holiday. The traffic counts, which were collected between 2011 and 2015, were compiled from different sources, including LADOT’s traffic count database and traffic impact studies for other projects. To check the validity of the older counts and assess potential changes in travel patterns resulting from the recent addition of on-street bike lanes in downtown, traffic counts were updated in 2014-2015 using a representative set of study intersections. To represent existing conditions, all traffic counts were normalized to 2014–2015.

All of the study intersections are signalized. Each study intersection was analyzed to determine peak-hour operations and LOS. LOS for signalized intersections is generally based on delay values using the Transportation Research Board’s 2010 *Highway Capacity Manual* methodology. These values are calculated using the average delay (in seconds) per approaching vehicle. *Synchro*
software, version 8.0, was used to analyze peak-hour intersection traffic operating conditions. This is a widely-accepted tool used to calculate LOS based on the delay methodology presented in the *Highway Capacity Manual*, which is the industry standard for analyzing traffic intersection operating conditions. Furthermore, this methodology approach was reviewed and approved by LADOT prior to initiating the traffic study analysis and evaluation. The *Transportation Technical Study* was prepared assuming streetcar operations would begin in late 2020. It has been determined that operations would now begin 6 months later than previously assumed for the Project resulting in a 2021 opening date. Nevertheless, the traffic analysis considered impacts running through a 2040 horizon date, concluding the Project will have no detrimental impacts through that horizon date. A six-month delay in the opening date does not substantially alter this analysis.

Streetcar vehicles would travel along the proposed alignment with vehicular traffic, predominantly in the curb lane of the roadway using a fixed rail guideway. The streetcar rails would be flush with the roadway surface so that vehicular traffic can also operate in the same lane. A literature review of streetcar studies in other parts of the country was conducted to inform how the physical and operational characteristics of a streetcar would affect roadway capacity. Included in this review were the following sources: *Kansas City Downtown Streetcar Project Transportation Technical Report*, *Portland Streetcar Loop Project Traffic Technical Memorandum*, *Seattle First Hill-Capitol Hill Streetcar Line* and *Seattle South Lake Union Streetcar Project Transportation Technical Report*. Based on this review, it was determined that a streetcar affects roadway capacity and operations in a manner similar to an articulated bus running in the travel lane. Because the streetcar operates on a fixed guideway, safe and reliable operating conditions would be maintained by complying with the applicable CPUC standards and guidelines.

In order to calculate vehicle trips, the streetcar vehicle must be converted to represent a type of vehicle in the traffic stream that operates in the same way as other vehicles, which, in the case of the Project streetcar, would be similar to that of an articulated bus. Then, a passenger car equivalency factor is used to convert the large streetcar vehicle in the traffic stream to the physical and operational characteristics that are similar to those of a passenger car. The Project estimated streetcar vehicle length (approximately 65–85 feet) would be up to 2.13 times the length of a standard 40-foot bus. Therefore, because operation of a standard bus in traffic flow is equivalent to two passenger cars, the operation of a streetcar would be equivalent to 4.26 passenger cars. This factor was then used to reflect both the physical and operational characteristics of a typical streetcar vehicle.

Based on the proposed seven-minute headway operation of the streetcar during the peak periods, a total of nine streetcar passbys would operate during the AM and PM peak hours. This is equivalent to approximately 39 additional vehicle trips during each AM and PM peak hour. The additional vehicle trips take into consideration the operating characteristics of a streetcar vehicle, including start-up delays.

Based on estimates from the FTA STOPs Model (Version 2.0), streetcar service would result in a shift among travel modes, including auto, bus, rail, bicycle and pedestrian modes. Although revitalization of the study area may generate new trips that would utilize the streetcar during the off-peak weekday period and the weekend, it is anticipated that, during the AM and PM commute peak hours, the availability of streetcar service would result in a net mode shift of existing trips toward transit, which would attract patrons to use the streetcar. Commute trips would be generated by streetcar operators and MSF workers, but the few number of trips would not alter traffic operations in the project area due to their low volumes.
This discussion summarizes potential impacts and the LOS analysis for all 65 intersections may be reviewed in Appendix I. Delays resulting in reduced LOS would occur at the Hill Street/7th Street intersection during the AM and PM peak hours. The increased delay would be due to the addition of a protected signal phase for the streetcar. Physical traffic improvement options were evaluated in an attempt to mitigate the increased delay, but none were found to be feasible. The single impacted intersection would not result in a substantial effect to traffic patterns in downtown Los Angeles as many alternate routes are available to vehicles. In addition, transportation modeling indicates that the Project would reduce VMT within downtown Los Angeles by 6,327 miles per day in early 2021 and 7,431 miles per day in 2040. The VMT reductions would result in travel time benefits in other areas of downtown Los Angeles. In a system-wide context, a localized adverse operational impact in LOS at a single intersection related to on-road motor vehicle traffic is offset by notable reductions in VMT and other transit benefits from the Project, including increased local mobility. Accordingly, environmental impacts related to operational traffic are not considered to be adverse impacts.

**Effect TRAF-2: Public Transit**

**Not Adverse.** The Project would provide an additional public transit option in the Study Area, with an emphasis on short-distance trips among the various districts within downtown Los Angeles and to/from regional transit stations and stops. Underground and grade separated services, such as the existing Red, Purple, Blue, and Expo lines, would not be affected by implementation of the Project. Bus service along the alignment would remain and would operate alongside the streetcars. Some of the streetcar platforms could be shared by Metro, LADOT DASH, and other regional buses. Because bus service would operate within the same traffic conditions as other vehicular traffic, transit users would experience similar time delays at the intersections projected to experience adverse effects, as identified above. If any modifications to the bus operations or stop locations are needed, they would be evaluated by the appropriate transit agencies and adjusted accordingly. The Project would supplement both regional transit services and local circulators in the Study Area. Therefore, the Project would not result in an adverse effect related to public transit.

**Effect TRAF-3: Parking**

**Not Adverse.** A total of 367 on-street parking and loading spaces have been inventoried along the alignment; most of these spaces also occupy areas that are also travel lanes and do not allow parking during peak periods. The Project would result in the loss of an estimated 19 on-street parking spaces. The Project aims to support non-motorized modes of travel in the area, and is consistent with LADOT’s policies in developing transportation demand management measures that reduce single-occupancy vehicle trips and encourage ridesharing and transit use. The reduction of vehicular trips offsets the need to replace lost on-street parking spaces. Therefore, the Project would not result in an adverse effect related to parking.

### 4.13.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option would result in additional streetcar operations within the right-of-way. In addition to the Hill Street/7th Street impact discussed above for the Project, the Grand Avenue Extension Design Option would impact following two intersections in early 2021 and 2040 during the listed peak hour:

- Grand Avenue/1st Street (PM)
- Hill Street/1st Street (AM and PM)
The increased delay would be due to the addition of a protected signal phase for the streetcar. Physical traffic improvement options were evaluated in an attempt to mitigate the increased delay, but none were found to be feasible. Considering the regional context, the Project with the Grand Avenue Extension Design Option would adversely affect 3 of 65 analyzed intersections. In a system-wide context, a localized adverse operational impact in LOS at two intersections related to on-road motor vehicle traffic is offset by the increased reductions in VMT and other transit benefits from the Grand Avenue Extension Design Option, including increased local mobility and increased ridership. Accordingly, environmental impacts related to operational traffic for the Grand Avenue Extension Design Option are not considered to be adverse impacts.

An additional five on-street parking and loading spaces, for a total of 372, have been inventoried along the streetcar alignment. Similar to as discussed above for the Project, implementation of the Grand Avenue Extension Design Option would not result in an adverse effect related to parking or public transit.

### 4.13.3 Measures to Minimize Harm

The City-adopted Downtown Design Guidelines and new street standards establishes the roadway width for the majority of streets in downtown Los Angeles. Street widening is not feasible either due to these new standards or because it was not considered practical or desirable to widen the street at the expense of reduced sidewalk widths. No feasible measures have been identified to minimize or eliminate adverse intersection effects.

### 4.14 Visual Quality

This section describes the potential for effects related to visual quality. The information presented in this section is based on the Visual Impact Analysis (VIA), which is included as Appendix J. The process used in the VIA follows the guidelines outlined in Visual Impact Assessment for Highway Projects (Federal Highway Administration 1988). The affected environment and environmental consequences are summarized below. Refer to Section 3.1, Aesthetics, of the Draft EIR for detailed descriptions of the affected environment.

#### 4.14.1 Affected Environment

There are multiple federal and local regulations and guidance relevant to visual quality. These include:

- Federal Highway Administration Visual Impact Assessment for Highway Projects (Federal Highway Administration 1988) - This provides an analytical framework for identifying and assessing qualitative changes to the visual environment that could be introduced as part of a transportation project, regardless of whether the project calls for public transit or highway improvements, parkland improvements, or architectural design intervention.

- LAMC - The LAMC sets forth regulations and standards regarding the allowable type, density, height, and design of new development projects. The LAMC restricts light spill onto adjacent properties and provides minimum luminance levels for safety within and around parking facilities states that plans for street lighting shall be submitted to and approved by the Bureau of Street Lighting for subdivision maps.
City Planning Documents - Relevant City planning documents include Citywide General Plan Framework Element including the Mobility Plan 2035, Central City Community Plan, 2008 Walkability Checklist, 2011 Citywide Design Guidelines, Downtown Design Guide, BSMP, and HDLADG.

The BSMP and HDLADG are of particular relevance to the Project. The BSMP provides a vision for design improvements along Broadway, a menu of design tools and streetscapes, and other design criteria germane to design within individual street blocks. The BSMP prioritizes pedestrian and public transit circulation over the private auto. The purpose of the HDLADG is to aid downtown business improvement districts (BIDs), the Los Angeles Conservancy, government agencies, building owners, developers, and architects in implementing effective preservation and adaptive reuse projects that protect, highlight, and promote downtown's historic character. Although focused almost entirely on building design, retrofit, maintenance, appropriate building addition design and integration, and signage design, HDLADG guidance is premised on the eventual reintroduction of streetcars and/or trolley lines in the Historic Downtown neighborhood.

The existing visual environment is highly urban, and includes multiple skyscrapers and multi-story buildings that obstruct expansve views of the landscape beyond downtown. There are few scenic vistas, other than views that may be available to occupants from the taller buildings in downtown Los Angeles. Visual and scenic resources within downtown primarily consist of groupings of architecturally and historically significant buildings and other design elements of secondary importance, such as landscape features, including Pershing Square and the Los Angeles Civic Center, and mature street trees. Unique modern buildings along Grand Avenue, such as the Disney Concert Hall and MOCA, and the historic buildings within and around the Broadway Theatre and Commercial Historic District serve as the primary visual resources within the study area.

Refer to the VIA for a detailed description of how the existing visual environment has been defined in accordance with the FHWA guidance. Briefly, a number of variables affect the degree of visibility, visual contrast, and the ultimate impact of a project. Such variables include the scale and size of facilities, distances and viewing angles, color and texture, and the influences of adjacent scenery or land uses. Even where visible, viewer response and sensitivity vary depending on viewer attitudes and expectations. The visual character of a view is described by the topography, land uses, scale, form, and natural resources depicted in the view. The assessment of the visual character is intended to be descriptive rather than evaluative, and is based on defined attributes, such as physical traits—including form, color, line, and texture (pattern elements)—as well as pattern character traits—the dominance, scale, and diversity or continuity of visual elements. Visual quality refers to the aesthetics of a view. Determining the quality of a view can be subjective because it is based in part on the viewer's values and notions about what constitutes a quality setting. In an effort to establish a more objective framework, this assessment applies the evaluative criteria (i.e., vividness, intactness, and unity) and qualitative rankings (low, medium, and high) presented in the FHWA guidelines. Vividness is the visual power or memorability of landscape components as they combine in distinctive visual patterns. Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements. Unity is the visual coherence and compositional harmony of the landscape considered as a whole. The FHWA guidance utilizes a rating scale from 0 through 7, with 0 representing very low visual quality and 7 representing very high visual quality.

The FHWA guidance is also based on viewer response, which is composed of two elements: viewer sensitivity and viewer exposure. Viewer exposure is typically assessed by measuring the number of viewers exposed to the resource change, type of viewer activity, duration of their view, speed at
which the viewer moves, and position of the viewer. Viewer sensitivity is defined both as the viewer's concern for scenic quality and the viewer's response to change in the visual resources that make up the view.

The FHWA guidance defines the visual setting in terms of landscape units and/or key views. Due to the densely built-up character of the viewshed and the constrained sight lines from one portion of the study area to other portions, this assessment uses a key view approach in lieu of the landscape unit approach. A viewshed comprises all the surface areas visible from an observer's viewpoint. The limits of a viewshed are defined as the visual limits of the views from the Project. The viewshed also accounts for the locations of viewers likely to be affected by visual changes brought about by the Project. Because it is not feasible to analyze all the potential views of the Project, it is necessary to select a number of key viewpoints that would most clearly display the visual effects of the Project at representative locations along its alignment. Key views also represent the primary viewer groups that would potentially be affected by the Project.

For purposes of this analysis, a view is considered key if at least one of the following circumstances applies:

- Visual resources are present, regardless of the quality of the view. The sensitivity of the affected viewer group is moderate or high, and the duration of the view is long-term.
- The quality of the view is moderate or high, regardless of whether visual resources are present. The sensitivity of the viewer group is moderate or high, and the duration of the view is long-term.
- The view is distinct, clear, and unobstructed from the street to adjacent businesses and is viewed regularly by a large number of commuters. In this case, the viewer sensitivity is moderate, and the view is long-term.

Key observation points (KOPs) identify key views that document the visual character and quality of the corridor in highly representative ways, or from the perspective of sensitive viewers (e.g., residents). The analysis identified seven such specific views that could be altered to some degree by the Project. These KOPs document key views at the vantages presented below. The existing views are shown in the Environmental Consequences section to provide side-by-side views of the Project and the existing environment.

- **KOP 1**: Broadway between 5th and 6th Streets, looking north, documents a representative section of this heavily traveled retail shopping street framed by historic commercial buildings and a noteworthy collection of historic movie theaters. Broadway draws large numbers of pedestrians.
- **KOP 2**: Figueroa Street, looking north to Olympic Boulevard, documents the streetscape adjoining the LASED and defined north of Olympic Boulevard by highly varied architectural design. Figueroa Street is a highly-trafficked thoroughfare and is familiar to many LASED and downtown visitors and commuting motorists.
- **KOP 3**: West 7th Street at Flower Street, looking east, documents a representative section of the street framed by historic commercial buildings of comparable height that form a strongly defined streetwall. West 7th Street marks the southern boundary of the Financial District and is a major transit transfer location for Metro trains and buses, as well as DASH. It features large numbers of pedestrians.
- **KOP 4**: Hill Street at 6th Street, looking north. Pershing Square, a well-known downtown visual landmark, appears as a vivid visual element at middle ground, framed by tall buildings of highly varied design.
- KOP 5: West 11th Street at Broadway, looking west. The Herald-Examiner Building, which is an architectural and historic landmark, appears in the foreground portion of the view on the left.
- KOP 6: West 11th Street between Hope and Flower Streets, looking west. The view documents the dense cluster of high-rise residential development that exists along this segment of 11th Street east of the LASED.
- KOP 7: Grand Avenue, near 2nd Street, looking north to 1st Street. Iconic Disney Concert Hall is in the foreground of the view on the left. The view documents the streetcar terminus adjoining key downtown cultural institutions, including the Music Center, Disney Hall, Colburn School of Performing Arts, MOCA, and the Broad.

Table 4.14-1 presents the visual quality ratings at the seven KOPs. A moderate rating indicates an adverse change to the visual resource with moderate viewer response. Impacts can be mitigated within five years using conventional practices. A moderately high rating indicates a visual resource change with high viewer response or high adverse visual resource change with moderate viewer response. Extraordinary mitigation practices may be required and landscape treatment required will generally take longer than five years to mitigate.

<table>
<thead>
<tr>
<th>KOPs</th>
<th>Vividness</th>
<th>Intactness</th>
<th>Unity</th>
<th>Average</th>
<th>Visual Quality Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOP 1</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>5.3</td>
<td>Moderately High</td>
</tr>
<tr>
<td>KOP 2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4.7</td>
<td>Moderately High</td>
</tr>
<tr>
<td>KOP 3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4.0</td>
<td>Moderate</td>
</tr>
<tr>
<td>KOP 4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5.0</td>
<td>Moderately High</td>
</tr>
<tr>
<td>KOP 5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4.0</td>
<td>Moderate</td>
</tr>
<tr>
<td>KOP 6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4.0</td>
<td>Moderate</td>
</tr>
<tr>
<td>KOP 7</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4.3</td>
<td>Moderate</td>
</tr>
</tbody>
</table>


4.14.3 Environmental Consequences

In the descriptions of the analysis and associated findings presented below, for each of the KOP view locations, references are made to the Grand Avenue Extension Design Option and MSF sites, where relevant. The absence of such reference in a given KOP discussion means that either the Design Option or MSF is not located the immediate vicinity of the KOP.

4.14.3.1 No Build Alternative

Not Adverse. Improvements and facilities associated with the Project would not be constructed under the No Build Alternative. This alternative represents conditions in the study area that would exist without implementation of the Project, and is utilized to assess the potential for adverse effects from the Project. The No Build Alternative condition represents planned future development in downtown Los Angeles, including transportation projects funded under the current RTP/SCS. As it relates to assessing Project impacts, the No Build Alternative does not include an action that would result in an adverse effect.
4.14.3.2 7th Street Alignment Alternative

Effect AEO-1: Visual Effects of the Streetcar Alignment

Not Adverse. All KOPs have been evaluated using “before-and-after” visual simulations. The EA provides a summary of the visual quality and conclusions formed in the VIA. Refer to the VIA (Appendix J) for a detailed comparison of the visually quality with and without the Project.

Tables 4.14-2 through 4.14-5 summarizes the determination of effects to visual resources. The Project would not result in an adverse effect to visual resources. The details associated with each KOP are discussed below.

Table 4.14-2. Average Visual Quality at Key Observation Points

<table>
<thead>
<tr>
<th>KOPs</th>
<th>Vividness</th>
<th>Intactness</th>
<th>Unity</th>
<th>No Project Average</th>
<th>Average Under Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOP 1</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>KOP 2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>KOP 3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5.0</td>
<td>4.7</td>
</tr>
<tr>
<td>KOP 4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4.0</td>
<td>3.7</td>
</tr>
<tr>
<td>KOP 5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>KOP 6</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4.3</td>
<td>4.3</td>
</tr>
<tr>
<td>KOP 7</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>5.3</td>
<td>5.3</td>
</tr>
</tbody>
</table>


Table 4.14-3. Change from Existing Conditions at Key Observation Points

<table>
<thead>
<tr>
<th>KOPs</th>
<th>No Project</th>
<th>Project</th>
<th>Change from Existing Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOP 1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>KOP 2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>KOP 3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>KOP 4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>KOP 5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>KOP 6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>KOP 7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 4.14-4. Visual Quality Rating at Key Observation Points

<table>
<thead>
<tr>
<th>KOPs</th>
<th>No Project</th>
<th>Project</th>
<th>Grand Ave. Des. Opt.</th>
<th>TPSS</th>
<th>MSF A</th>
<th>MSF B</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOP 1</td>
<td>No Change</td>
<td>Moderately high</td>
<td>Moderately high</td>
<td>Low</td>
<td>Low</td>
<td>No Change</td>
</tr>
<tr>
<td>KOP 2</td>
<td>No Change</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>No Change</td>
<td>No Change</td>
</tr>
<tr>
<td>KOP 3</td>
<td>No Change</td>
<td>Moderate</td>
<td>Moderate</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
</tr>
<tr>
<td>KOP 4</td>
<td>No Change</td>
<td>Moderate</td>
<td>Moderate</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
</tr>
<tr>
<td>KOP 5</td>
<td>No Change</td>
<td>Moderate</td>
<td>Moderate</td>
<td>No Change</td>
<td>No Change</td>
<td>Low</td>
</tr>
<tr>
<td>KOP 6</td>
<td>No Change</td>
<td>No Change</td>
<td>Moderately high</td>
<td>Low</td>
<td>No Change</td>
<td>No Change</td>
</tr>
<tr>
<td>KOP 7</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
</tr>
</tbody>
</table>

Notes: MSF A refers to the 2nd and Broadway MSF site. MSF B refers to the 11th Street and Olive Street (East) MSF site.

Table 4.13-5. Summary of Effects at Key Observation Points [by Project Alternative/Element]

<table>
<thead>
<tr>
<th>KOPs</th>
<th>No Project</th>
<th>Project</th>
<th>Grand Ave. Des. Opt.</th>
<th>TPSS</th>
<th>MSF A</th>
<th>MSF B</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOP 1</td>
<td>No Effect</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>KOP 2</td>
<td>No Effect</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>KOP 3</td>
<td>No Effect</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>KOP 4</td>
<td>No Effect</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>KOP 5</td>
<td>No Effect</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>KOP 6</td>
<td>No Effect</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>KOP 7</td>
<td>No Effect</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Notes: MSF A refers to the 2nd and Broadway MSF site. MSF B refers to the 11th Street and Olive Street (East) MSF site.

Visual Effect at KOP 1: Broadway between 5th and 6th Streets, Looking North

KOP 1 has views of the Broadway Theatre and Commercial Historic District. As shown in Figure 4.14-1, the streetwall, which refers to one of the long side boundaries of a street formed by its buildings, hedges, and other visual elements, on both sides of Broadway is unbroken, framing both south- and north-facing views down the street at this vantage point. Visual quality is moderately high due to the historic design character of Broadway. The rectilinear forms of the buildings and the consistent, classically inspired architectural language, architectural cladding materials, and coloration (e.g., tan, gray, off-white) create strong visual interest (vividness) as well as strong visual unity. However, the large quantity of business signs and conflicting sign treatments, placements, colors and patterns, combined with traffic signal lighting, diminishes the intactness of the view. The gray roadway and sidewalk paving are dominant in terms of line, color, and texture, and add a strong element of unity to the view. The existing view does not include the approved BSMP project...
As shown in Figure 4.14-2, Project features include installation of tracks, new paving along the track path, and new accent paving that would be consistent in its gray coloration with the existing sidewalks. Slight changes to the simulated view along Broadway could occur, depending on the final alternative selection. The bulk of design changes in this viewshed would not be made as part of the Project, but rather, as part of the BSMP—a related project in visual terms; only the streetcar-specific elements, such as the streetcar platforms, are part of the Project. BSMP improvements would include widening the sidewalks along Broadway and may include adding station shelters for waiting passengers.

**Figure 4.14-2. (KOP 1). Simulated View along Broadway, between 5th and 6th Streets**
These shelters, if incorporated, may include benches and wayfinding signage beneath translucent roofs into single structures with very limited elements that have the potential to obscure views. Reconfiguring the sidewalks along the west side of Broadway, installing street furniture, and adding landscaping in above-ground planters and trees in wells protected by black metal grates are also proposed as part of the related BSMP, scheduled for implementation prior to the Project. Trees have the potential to be removed along the Project alignment. In compliance with the City of Los Angeles Tree Preservation Ordinance and Tree Preservation Policy, any trees slated for removal would be replaced at or near their original locations at 2:1 or 4:1 ratios. As a result, no long-term visual effects related to trees are expected. Despite the extensive nature of the design interventions along Broadway proposed as part of the Project and BSMP, these combined elements would read as extensions of current public transit features and would add visually unifying elements to the view. The change in visual quality would be noticeable but would seem appropriate in scale and in keeping with the historic design character of Broadway. Streetcar interiors would be illuminated. Visual quality would remain moderately high.

As part of the Project, OCS electrical wiring would be included. There are two potential configurations for the OCS wires, which supply electrical current to the streetcar vehicles. The first configuration would be to support the contact wire with a span wire between two poles perpendicular to the streetcar track. The second configuration would support the contact wire from cantilever arms connected to a single pole. Both of these configurations would use decorative poles consistent with the streetscape along the Project alignment, with the possibility of integrating poles used for street lighting, traffic signals, or traffic signs. OCS suspension at turning locations would be more specialized and specific to each location, possibly requiring a combination of wire-mounting configurations. Despite the extensive nature of the design interventions along Broadway proposed as part of the Project and BSMP, these combined elements would read as extensions of current public transit features and would add visually unifying elements to the view. The change in visual quality would be noticeable but would seem appropriate in scale and in keeping with the historic design character of Broadway.

The Project would occur within the Broadway Theatre and Commercial Historic District. Although no officially recognized scenic views occur in this setting, views along Broadway are considered important due to the concentration of architectural/historical resources. However, because the Project features within the public right-of-way read as extensions of the street and of the downtown public transit system and would seem appropriate to the setting in scale and design terms, viewer response is expected to be moderate and positive, for both sensitive viewers (e.g., sightseers and other viewers traveling for pleasure) and less-sensitive viewers.

The existing visual quality rating of KOP 1 is moderately high. Under the Project, the overall visual quality rating would remain moderately high. Since viewer sensitivity in this area is moderate to high but the visual quality rating would remain moderately high, there would be a negligible adverse effect on visual resources for KOP 1.

**Visual Effect at KOP 2: Figueroa Street, Approaching Olympic Boulevard, Looking North**

KOP 2 has views of dramatic and highly varied architectural forms, with divergent architectural cladding, textures, and coloration. As shown in Figure 4.14-3, many of the buildings are high-rise structures, producing a series of individuated vertical line elements in the view that are moderately powerful in visual terms, and vivid. The verticality is contrasted at the first floor-level of the buildings by rectilinear architectural features that are more horizontal in alignment than vertical.
Also, due to their curvilinear form, evergreen color, and texture, the street trees (*Ficus* spp.) are a noteworthy visual element of secondary importance that contrasts with the pronounced verticality of the architectural forms. The horizon serves as the focal point in the backdrop of the view. The streetwall on both sides of Figueroa Street is porous, only partially framing views down the street at this vantage point. The gaps between buildings, and the highly varied architectural design and heights of the buildings, create moderate visual interest (vividness) while conveying only a moderately low degree of visual unity (due to the highly varied architectural detail, color, building placements, and heights). The gray roadway and sidewalk paving is dominant in the view in terms of line, color, and texture, and offers both a contrasting and visually unifying element. The view is largely free of distracting, cluttering elements, such as traffic light/signage, and building signage is subdued and fitted to the architectural forms of the buildings, thereby conveying a moderate degree of intactness. The existing view does not depict the proposed Figueroa Corridor Streetscape Project.

As shown in Figure 4.14-4, design changes in this viewshed would include those made as part of the Project as well as those of the Figueroa Corridor Streetscape Project—a related project in visual terms. Figueroa Corridor Streetscape Project improvements would include a bikeway (already in place and delineated with striping), landscaping, and some reconfiguration of driving lanes. Installation of tracks and new paving along the track path, accompanied by street restriping to demarcate the shared bus, motor vehicle, and streetcar right-of-way, bikeway, and reconfigured drive lanes, would read as extensions of the street and current public transit features, such as bus stops, and would add visually unifying elements to the view.
Similar to as discussed for KOP 1, aerial components such as catenary poles and OCS wires would be minimally apparent and would not block informal views. Streetcar-related platforms and platform shelters would not be of sufficient scale or bulk to cast shadows of sufficient size to affect shade-sensitive uses. Nor would these features significantly alter ambient illumination levels or result in spill light impacts on surrounding uses. Trees slated for removal would be replaced at or near their original locations at 2:1 or 4:1 ratios. The streetcar trains would be designed and lighted in a manner that would minimize the potential for spill light effects and would not generate more nighttime light on the streets than existing downtown buses. The Project would occur as part of a heavily trafficked thoroughfare and in a design setting where no officially recognized scenic views or noteworthy informal views are present. Moreover, because the Project features proposed within the public right-of-way would read as extensions of the street and of the downtown public transit elements and would seem appropriate to the setting in scale and design terms, viewer response is expected to be minimal.

The existing visual quality rating of KOP 2 is moderate. Under the Project, the overall visual quality rating would remain moderate. Since viewer sensitivity in this area is moderate to high but the visual quality rating would remain moderate, there would be a negligible adverse effect on visual resources for KOP 2.

**Visual Effect at KOP 3: West 7th Street, Approaching Flower Street, Looking East**

KOP 3 has views of the rectilinear forms of buildings and consistent, classically inspired architectural language, architectural cladding materials, and coloration (e.g., tan, gray, brown) create strong visual interest (vividness) as well as strong compositional unity. As shown in Figure 4.14-5, the streetwall on both sides of 7th Street is unbroken, framing both west- and east-facing views down the street at this vantage point.
With its horizontal line pattern, texture, and gray coloration, the roadway and sidewalk paving serve to strongly focus the view and provide one element of contrast to the dominant vertical line components conveyed by the architectural forms. Also, due to their curvilinear form, evergreen color, and texture, the *Ficus* street trees are a noteworthy visual element of secondary importance that contrasts with the dominant rectilinear character of the architectural forms. The view is largely free of distracting, cluttering elements, such as traffic light/signage, and building signage is subdued and fitted to the architectural forms of the buildings, thereby conveying a moderately high degree of intactness. The view is dynamic due to the balance of unifying design elements, subtly differentiated design features, and the moderately strong tree canopy. Nighttime lighting and glare from vehicle headlights are high, typical of a dense urban streetscape.

As shown in Figure 4.14-6, design changes in this viewshed would include those made as part of the Project, as well as those of the City's 2010 Bicycle Master Plan, the primary improvements of which would be the delineation of a bikeway (created through restriping) and the reconfiguration of driving lanes. The Project would include paving along the streetcar track path, restriping, and installation of an OCS electrical wiring support system. Installation of tracks and new paving along the track path, accompanied by street restriping to demarcate the shared bus, motor vehicle, and streetcar lane, bikeway, and reconfigured drive lanes, would read as extensions of the street and of current public transit features, such as bus stops, that exist within the public right-of-way, and would add visually unifying elements to the view. The change would be slightly noticeable on this heavily trafficked thoroughfare and would introduce nominal changes to its design setting, including station platforms, railings, and OCS electrical wiring.
Similar to as discussed for KOP 1, aerial components such as catenary poles and OCS wires would be minimally apparent and would not block informal views. Streetcar-related platforms and platform shelters would not be of sufficient scale or bulk to cast shadows of sufficient size to affect shade-sensitive uses. Nor would these features significantly alter ambient illumination levels or result in spill light impacts on surrounding uses. Trees slated for removal would be replaced at or near their original locations at 2:1 or 4:1 ratios. The streetcar trains would be designed and lighted in a manner that would minimize the potential for spill light effects and would not generate more nighttime light on the streets than existing downtown buses. The Project would occur as part of a heavily trafficked thoroughfare and in a design setting where no officially recognized scenic views or noteworthy informal views are present. Moreover, because the Project features proposed within the public right-of-way would read as extensions of the street and of the downtown public transit elements and would seem appropriate to the setting in scale and design terms, viewer response is expected to be minimal.

The existing visual quality rating of KOP 3 is moderately high. Under the Project, the overall visual quality rating would be reduced one level, to moderate. Although viewer sensitivity in this area is moderate to high, the Project would be appropriate to the setting in scale and design terms and viewer response would be minimal. Therefore, there would be a negligible adverse effect on visual resources for KOP 3.

**Visual Effect at KOP 4: Hill Street, Approaching West 6th Street, Looking North**

KOP 4 has highly varied visual elements in terms of building architectural design, height, and exterior cladding materials (e.g., glass skin, brick, concrete, terra cotta). As shown in Figure 4.14-7, vertical line elements are dominant, and the degree of contrast, due to differentiation in size, placement, and architectural design detail, is high.
The streetwall on both sides of Hill Street is porous, only partially framing north- and south-facing views down the street at this vantage. Because of the moderately dense clustering of trees and understory landscaping along the west side of Hill Street, Pershing Square, with its curvilinear form, evergreen color, and texture, provides a significant and vibrant contrasting component to the strongly individualized building forms. The rectilinear forms of the buildings and the non-continuous, classically inspired architectural language, architectural cladding materials, and differentiation in coloration (e.g., tan, brown, gray, green-blue, off-white) create moderate visual interest (vividness) as well as moderately low visual unity. The gray roadway and sidewalk paving are dominant in the view in terms of line, color, and texture and add a strong element of unity. The view is relatively free of distracting, cluttering elements, such as traffic lights/signage. Building signage is subdued and fitted to the architectural forms of the buildings, thereby conveying a moderately high degree of intactness. Nighttime lighting and glare from vehicle headlights are high, typical of a dense urban streetscape.

As shown in Figure 4.14-8, the installation of tracks and new paving along the track path, accompanied by street restriping to demarcate the shared streetcar/bus/motor vehicle lane and reconfigured drive lanes, would read as an extension of current public transit features, such as bus stops, that occur within the existing public right-of-way. Similar to as discussed for KOP 1, aerial components such as catenary poles and OCS wires would be minimally apparent and would not block informal views. Both configurations would use decorative poles consistent with the streetscape along Hill Street, with the possibility of integrating poles used for street lighting, traffic signals, or traffic signs. Trees slated for removal would be replaced at or near their original locations at 2:1 or 4:1 ratios.
Streetcar platforms and shelters would not cast shadows that would affect shade-sensitive uses, nor would these features significantly alter ambient illumination levels or result in impacts on surrounding uses related to spill light. The streetcar trains would be lighted in a manner that would minimize the potential for spill light. They would not generate more nighttime light than existing downtown buses.

The Project would occur in a setting that is characterized by a mix of both new, non-historic buildings and older architectural/historical resources, including Pershing Square, the visual centerpiece. Although no officially recognized scenic views occur in this setting, views to and from Pershing Square are considered important because of its role as a key downtown park and its design as landscaped open space. However, because Project features would read as extensions of the street and extant downtown public transit elements and seem appropriate in terms of scale and design to their setting adjoining Pershing Square, viewer response is expected to be minimal. The change would be slightly noticeable on this thoroughfare and would introduce nominal changes to a design setting, which possesses only moderate visual quality.

The existing visual quality rating of KOP 4 is moderate. Under the Project, the overall visual quality rating would remain moderate. Since viewer sensitivity in this area is moderate to high but the visual quality rating would remain moderate, there would be a negligible adverse effect on visual resources for KOP 4.
Visual Effect at KOP 5: 11th Street at Broadway, Looking West

The KOP 5 streetscape is characterized by highly varied architectural forms, with divergent building heights, architectural cladding, textures, and coloration. As shown in Figure 4.14-9, the dominant line pattern in the view is vertical because of the presence of large high-rise buildings in the mid-frame and far-off portions of the view, including the 54-story portion of the Ritz Carlton and Residences complex and the Elleven Lofts and Luma South condominium buildings (19 stories and 13 stories, respectively). However, the low-rise buildings in the foreground, along with the road pavement, provide a contrasting horizontal line pattern of secondary importance. These contrasting vertical and horizontal line elements in the view are only moderately powerful and vivid, with the architectural elements within the LASED—roughly 0.5 miles to the west—forming the backdrop to the view. In the foreground, framing the view on the left, is the Herald-Examiner building, an architectural/historical landmark and an important visual resource along both Broadway and 11th Street. Among the distinctive Mission Revival features of the Herald-Examiner building are its yellow, blue, and white ceramic-clad domes; mission-style tiled roof; arched openings; and decorative metal balcony railings. Although they form a discontinuous line along 11th Street, the yew (Podocarpus macrophyllus) street trees are a noteworthy visual element of secondary importance. Their curvilinear form, evergreen color, and texture contrast with the architectural forms. The existing view does not depict the Figueroa Corridor Streetscape Project.

Figure 4.14-9. (KOP 5). View along 11th Street at Broadway, Looking West

A range of colors can be seen in this view. These include the pale pink-beige color of the Herald-Examiner building, off-white and beige coloration of some of the mid-frame buildings, the light gray-blue of the high-rise Ritz Carlton and Residences complex, and a range of brown shades, from light to dark. The green color of the street trees and the gray asphalt paving provide contrast. The streetwall on both sides of 11th Street is porous, only partially framing views down the street from this vantage.

The gaps between the buildings provide views of asphalt-paved surface parking lots. Considered together with the highly varied architectural design and the heights of the buildings, these elements
create moderate visual interest (vividness) while conveying only a moderately low degree of visual unity (due to the highly varied architectural detail, color, building placements, and heights). The view has a few distracting, cluttering elements, such as billboards and traffic lights or signage. Building signage is generally subdued and fitted to the architectural forms of the buildings, giving the view a moderate degree of intactness. Nighttime lighting and glare from vehicle headlights are high, typical of a dense urban streetscape.

As shown in Figure 4.14-10, design changes in this viewshed would include those made as part of the Project and those that would be part of the Figueroa Corridor Streetscape Project—a related project in visual terms. The Project would reconfigure driving lanes, and the Figueroa Corridor Streetscape Project would provide a bikeway along 11th Street, groundcover parkway landscaping, and supplemental street trees. The planting of a large number of new trees with a dense and consistent placement would add a visually unifying element to the view. The tracks and new paving along the track path, accompanied by street restriping to demarcate the shared motor vehicle lane/streetcar right-of-way and the bikeway, would read as an extension of the street. These would also be visually unifying elements. Because this vantage depicts the streetcar at a location where it would turn from one street to another, the OCS electrical wiring would include several components, based on which of the two potential configurations is selected. Both of these configurations would use decorative poles consistent with the streetscape along 11th Street and Broadway, with the possibility of integrating poles used for street lighting, traffic signals, or traffic signs. Trees slated for removal would be replaced at or near their original locations at 2:1 or 4:1 ratios.

The change as a result of the Project and the related Figueroa Corridor Streetscape Project, whether considered separately or together, would clearly be noticeable, particularly along 11th Street, which is a fairly narrow thoroughfare. The large number of OCS-related guy wires associated with the train where it would turn the corner would also be noticeable. Nonetheless,
the degree of change, in terms of scale and design, would seem appropriate in relation to the setting. Features proposed as part of the Figueroa Corridor Streetscape Project, such as additional street trees and continuous parkway groundcover planting, would add greater visual cohesion and potentially enhance intactness. Streetcar platforms and shelters would not cast shadows that would affect shade-sensitive uses, nor would these features significantly alter ambient illumination levels or result in impacts on surrounding uses related to spill light. The streetcar trains would be lighted in a manner that would minimize the potential for spill light. They would not generate more nighttime light than existing downtown buses. The Herald Examiner building is the key architectural/historical resource in the viewshed. The Ritz Carlton serves as a visual landmark and focal point in the backdrop of the view. No officially recognized scenic views or noteworthy informal views are present within the design setting. Viewer response is expected to be minimal because Project features would read as extensions of the street as well as extant downtown public transit elements and seem appropriate to the setting in terms of scale and design. The OCS wires at this location would be more noticeable than they would be at other locations along the alignment; however, the degree of change in the view would still be quite minor. Outside of the intersection of 11th Street and Broadway, no views of architectural resources, such as the Herald Examiner building, would be impaired.

In addition, Figueroa Corridor Streetscape Project landscape features (e.g., supplemental street trees and parkway groundcover plantings) would add a degree of visual cohesiveness to the view.

The existing visual quality rating of KOP 5 is moderate. Under the build alternative, including the Grand Avenue Extension Design Option, the overall visual quality rating would remain moderate. Since viewer sensitivity in this area is moderate to high but the visual quality rating would remain moderate, there would be a negligible adverse effect on visual resources for KOP 5.

**Visual Effect at KOP 6: 11th Street at Grand Avenue, Looking West**

The KOP 6 streetscape is characterized by highly varied architectural forms, with divergent building heights, architectural cladding, textures, and coloration. As shown in Figure 4.14-11, the dominant line pattern in the view is vertical because of the presence of large high-rise buildings in the foreground and mid-frame portions of the view—including the 54-story portion of the Ritz Carlton and Residences complex in mid-frame (right) and the Elleven Lofts and Luma South condominium buildings (19 stories and 13 stories, respectively) in the foreground (left). Medium-rise buildings, such as the Desmond’s warehouse, occur in the foreground (right) and at mid-frame (left and right). Combined with the road pavement, these elements provide a contrasting horizontal line pattern of secondary importance. The contrasting vertical and horizontal line elements in the view are moderately powerful and vivid, with the architectural elements within the LASED forming the backdrop to the view. Although they are non-uniform in their placement and shape, the yew street trees and the taller, more broadly silhouetted Tipu (Tipuana tipu) trees along 11th Street are noteworthy visual elements of secondary importance; their curvilinear form, evergreen color, and texture contrast with the architectural forms. The existing view does not depict the proposed Figueroa Corridor Streetscape Project.
Figure 4.14-11. (KOP 6). View along 11th Street at Grand Avenue, Looking West

There is little continuity in the range of colors seen in this view. Colors include the pale gray/beige-pink tone of the Elleven condominiums buildings, the brown-gray color of the adjoining Luma South Building, the beige and brown brick coloration of some of the mid-frame buildings, and the light gray-blue of the high-rise Ritz Carlton and Residences complex. The green color of the street trees, as well as the gray asphalt paving, provides some limited contrast in terms of form, coloration, and texture. The streetwall on both sides of 11th Street is porous because of the varying building heights and at least one surface parking lot. It only partially frames views down the street at this vantage. Considered together with the highly varied architectural design and heights of the buildings, the elements combine to evoke only moderate visual interest (vividness). They convey only a moderately low degree of visual unity because the highly varied architectural detail, color, building placements, and heights diminish the sense of cohesiveness. The view has only a few distracting, cluttering elements, such as traffic lights and signage, including temporary street construction signage. Building signage is generally subdued and fitted to the architectural forms of the buildings, giving the view a moderate degree of intactness. Nighttime lighting and glare from vehicle headlights are high, typical of a dense urban streetscape.

As shown in Figure 4.14-12, design changes in this viewshed would include those made as part of the Project and those that would be part of the Figueroa Corridor Streetscape Project—a related project in visual terms. The Figueroa Corridor Streetscape Project would provide a bikeway along 11th Street, groundcover parkway landscaping, and supplemental street trees. Planting a large number of new trees with a dense and consistent placement would add a visually unifying element to the view. Similar to as discussed for KOP 1, aerial components such as catenary poles and OCS wires would be minimally apparent and would not block informal views. Streetcar-related platforms and platform shelters would not be of sufficient scale or bulk to cast shadows of sufficient size to affect shade-sensitive uses.
Nor would these features significantly alter ambient illumination levels or result in spill light impacts on surrounding uses. Trees slated for removal would be replaced at or near their original locations at 2:1 or 4:1 ratios. The streetcar trains would be designed and lighted in a manner that would minimize the potential for spill light effects and would not generate more nighttime light on the streets than existing downtown buses. Additionally, the proposed Project would provide tracks and new paving along the track path, accompanied by street restriping to demarcate the shared motor vehicle lane/streetcar right-of-way and the bikeway, which would read as an extension of the street.

The change as a result of the Project and the related Figueroa Corridor Streetscape Project, whether considered separately or together, would be clearly noticeable, particularly along 11th Street, which is a fairly narrow thoroughfare. Nonetheless, the degree of change, in terms of scale and design, would seem appropriate in relation to the setting. Also, features proposed as part of the Figueroa Corridor Streetscape Project, such as additional street trees and continuous parkway groundcover planting, could enhance intactness—one of the measures of visual quality—by adding greater visual cohesion. Visual quality, however, would remain moderate.

The tracks and new paving along the track path, accompanied by street restriping to demarcate the shared streetcar/motor vehicle lane and reconfigured drive lanes, would read as extensions of the current public street infrastructure that occurs within the existing public right-of-way. Viewer response is expected to be minimal because the Project features would read as extensions of the street infrastructure and seem appropriate to the setting in terms of scale and design. Accordingly, the degree of change in view would be negligible. Informal views across the viewshed of key buildings (e.g., Desmond’s warehouse; Ritz Carlton) would not be impaired because all streetcar infrastructure, with the exception of the OCS system and catenary poles, would be at
street level and would not affect views of key buildings. Also, the Figueroa Corridor Streetscape Project landscape features (e.g., supplemental street trees and parkway groundcover plantings) would add a small degree of visual cohesiveness to the view.

The existing visual quality rating of KOP 6 is moderate. Under Project, the overall visual quality rating would remain moderate. Since viewer sensitivity in this area is moderate to high but the visual quality rating would remain moderate, there would be a negligible adverse effect on visual resources for KOP 6.

Effect AEO-2: Visual Effects of TPSS

Not Adverse. The streetcar would be powered by an estimated five TPSS units spaced relatively evenly throughout the alignment and would measure approximately 17 feet long by 11 feet wide by 11 feet high, or of sufficient size to house the equipment. The TPSS units would be constructed outside the viewsheds within KOPs 3, 5, and 6. As a result, no new visual elements would be introduced and no resource change would occur.

Regarding KOP 1, one of the proposed TPSS unit locations is on 208 S. Broadway, as the Regional Connector Station lot is currently being designed and the potential for a TPSS units therein is being assessed by Metro and property owner to determine feasibility and capacity. A nearby alternative, on 229 S. Broadway, is also being considered. Regarding KOP 2, one of the proposed TPSS unit locations is on Figueroa Street, south of 9th Street, in a small parking lot. Regarding KOP 5, one of the proposed TPSS unit locations is on 431 Hill Street, which is located west of Hill Street between 4th and 5th Streets. Alternatively, a TPSS may be sited at 628 S. Hill Street. Currently, there is a privately owned small parking lot on the east side of Hill Street, south of 6th Street.

All of these TPSS unit locations would be very difficult to detect from the KOPs. For all views, the substations would be relatively small in size and given an architectural design treatment that would be compatible with adjacent buildings and neighborhood character. Their design, through adherence to pertinent downtown design guidelines (i.e., HDLADG and DDG) and other applicable regulations such as the LAMC Section 62.08, would minimize their presence in visual terms. As a result, adverse effects on visual resources would be avoided or substantially minimized at each TPSS unit location. Therefore, the Project would not result in an adverse effect related to views of TPSS units.

Effect AEO-3: Visual Effects of MSF

Not Adverse. Two sites are being assessed for the MSF: (1) the west side of Broadway between 2nd and 3rd Streets; or (2) the southeast corner of 11th and Olive Streets. The proposed MSF siting locations occur outside the viewsheds associated with KOPs 2, 3, and 6. As a result, no new visual elements would be introduced and no resource change would occur.

The MSF site on the west side of Broadway between 2nd and 3rd Streets would possibly be visible from KOPs 1 and 4, although the structure would be very difficult to detect. The area around the site is in a built up urban environment and contains a variety of land uses, including residential. South of 3rd Street are popular attractions such the Grand Central Market and the Bradbury Building. The MSF facility, in accordance with the DDG, would provide a continuous landscaped parkway next to the curb and would line the property with an attractive façade (no chain link or barbed wire) [City of Los Angeles, 2009]. Therefore, it would improve the quality of the surrounding viewshed and, as a public facility amongst a mix of land uses, would not disrupt the visual character of the project area.

Since the MSF site would be two or three stories high, due to the existing variety of building sizes and architectural elements, the scale and size of the proposed MSF would not substantially alter or
degrade existing views. Any nighttime lighting necessary for the operation of the MSF would be directed on site to minimize spill effects and reduce potential visual impacts related to nighttime illumination. Due to the highly-urbanized nature of the proposed site, its surrounding land uses, and the varying size of the neighboring buildings, high-rises and residences, the potential addition of nighttime lighting to the two- or three-story facility would not introduce a substantial amount of light when compared to existing conditions. Similarly, due to its relative size, the MSF facility would not compromise views to and/or from neighboring facilities along 2nd, 3rd, Broadway, and Hill Streets. Thus, this option would not degrade the visual character of the area, degrade open space elements, create an unacceptable degree of contrast, or compromise the nature and quality of key views within the project area. Rather, with its landscaped parkway and attractive façade, it would improve visual quality in the surrounding area. Furthermore, through adherence to pertinent downtown design guidelines (i.e., DDG) and other applicable regulations such as the LAMC and CBC, adverse effects on visual resources would be avoided or substantially minimized. Thus, the change in visual quality would be noticeable, but would seem appropriate in scale and in keeping with the historic design character of Broadway. Visual quality would remain moderately high. Changes to viewer quality would be low and viewer response would be minimal.

The MSF site on southeast corner of 11th Street and Olive Street would possibly be visible from KOP 5, although the structure would be very difficult to detect. The site would abut the 32-story AT&T Center, a building for lease on the southwest corner of the intersection of 11th Street and Hill Street, and various entities that are adjacent to the southeast corner of the existing parking lot, such as Bank of America and the west building of the City of Los Angeles Department of Public Works facility at 1149 South Broadway. As mentioned, the MSF would be integrated into its design setting with a very minor degree of contrast. No designated scenic corridors or officially recognized scenic views occur in this setting, though, the Herald-Examiner building is the key architectural/historical resource and the Ritz Carlton also serves as a visual landmark and focal point. The degree of view obstruction under this option would generally be very low, and the MSF would not block informal views. Because the MSF features would adhere to pertinent downtown design guidelines (i.e., HDLADG and DDG) and other applicable regulations, they would be appropriate to the setting in terms of scale and design to their setting along 11th Street. Changes to viewer quality would be low and viewer response would be minimal. Therefore, the Project would not result in an adverse effect related to views of the MSF.

4.14.2.2.1 Grand Avenue Extension Design Option

Implementation of the Grand Avenue Extension Design Option is represented by KOP 7, which has a view of Grand Avenue at 2nd Street. The streetwall is porous at this key view and is characterized by architecturally distinguished buildings that are spatially separate from one another, as well as a blend of vertical and horizontal line elements. The view is vivid due to the varied architectural expression and contrasting vertical, horizontal, and curvilinear line elements. Due to its highly animated, sculptural form, Disney Concert Hall is the key visual resource in the view, with the County Hall of Administration and Stanley Mosk Courthouse campus and the Music Center forming architectural backdrop elements in the middle ground portion of the view. Depending on the position and angle of the viewer, views can be had of visually prominent hillsides that define the northern edges of the City. The San Gabriel Mountains and their foothills form the backdrop for many views and viewsheds (all of the surface areas visible from an observer’s viewpoint) throughout the community. Directly across Grand Avenue to the south is a large parking structure on sloping terrain. The change in topography, along with continuous screening fencing (along Grand
Avenue) planted with vines, serves to obscure views of this structure along Grand Avenue. The view is also relatively free of obtrusive elements, such as business signage and clutter on building façades; traffic signage and signal equipment also is minimally evident. The roadway and sidewalk paving are dominant in the view, in terms of line, color, and texture, and add a strong element of unity. Off-white coloration seen on middle ground buildings, the silver color of Disney Concert Hall, and the gray color of the road pavement and sidewalks are dominant, and, along with street trees and other landscape elements outside the public right-of-way, further unify the view.

As shown in Figures 4.14-13 and 4.14-14, installation of tracks and new paving along the track path, construction of a concrete station platform in the center of Grand Avenue, with metal railings and platform light standards and signage, as well as the OCS system, read as extensions of current public transit features such as bus stops and would be minimally noticeable. A more noticeable element would be a concrete plinth, or possibly a concrete planter, that is likely to be placed at the end of the track to prevent trains from accidentally running off the end of the track. The exact design of such a feature, however, is as yet undetermined.

The Project would occur within the viewshed of Disney Concert Hall, with views to the foothills of the San Gabriel mountain range. The Project’s degree of view obstruction would be very low given that most of its features would be at, or slightly above, street level, and they are not opaque. In addition, aerial components such as catenary poles and OCS wires would be minimally apparent and would not block informal views. Streetcar-related platforms and platform shelters would not be of sufficient scale or bulk that they would cast shadows of sufficient size to affect shade-sensitive uses.

**Figure 4.14-13. (KOP 7). View along Grand Avenue at 2\(^{nd}\) Street, Looking North**
Nor would these features significantly alter ambient illumination levels or result in spill light impacts on surrounding uses. The streetcar trains would be lighted in a manner that would minimize the potential for spill light effects and would not generate more nighttime light on the streets than existing downtown buses generate. Although no officially recognized scenic views occur in this setting, views of the building are considered important due to its design quality and views of the foothills are publicly valued. Notwithstanding placement of the station stop adjacent to the iconic Disney Concert Hall, because the Project features proposed within the public right-of-way would read as extensions of the street and of the downtown public transit system, visual quality would remain moderate, and viewer response is expected to be minimal.

Large areas are available where a TPSS unit could be placed without interfering with loading docks or parking structure entrances. Another alternative is to place the TPSS unit at the northeast corner of Grand Avenue and 2nd Street, which would place the TPSS below street elevation, hidden behind an existing landscaped fence. From KOP 7, TPSS locations at these sites would be very difficult to detect. The proposed MSF siting locations occur outside the viewsheds within KOP 7. As a result, no new visual elements would be introduced and no resource change would occur.

Similar to as discussed above for the Project, implementation of the Grand Avenue Design Option would not result in an adverse effect related to visual resources.

### 4.14.4 Measures to Minimize Harm

**AES-01: Design of Traction Power Substation Structures.** The City of Los Angeles shall ensure that all TPSS structures would be designed to minimize their visual presence. Where site and design allow, the TPSS structures shall incorporate design and location features, such as the
minimization of the size of the structures, setbacks from adjoining street frontages, screening, and/or architectural treatments that are appropriate to the design setting where visible from the public right-of-way at street level. All TPSS structures shall be designed and built to satisfy the established final design requirements and in compliance with all applicable design guidelines, policies, and development standards, including required Public Benefit performance measures, if necessary. Should a TPSS be located within the public right-of-way, it shall be designed in conformance with the Los Angeles Above-Ground Facility regulations contained in Section 62.08 of the LAMC. LABOE shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

AES-O2: Maintenance Storage Facility Design. The City of Los Angeles shall ensure that the MSF site plan, building treatments and architecture would be appropriate in scale, proportion, and detail with appropriate use of material, texture, articulation, and color in consideration of the surrounding design context. The aesthetic treatment shall be designed and built in compliance with all applicable design guidelines, policies, and development standards. Light associated with the MSF shall be properly controlled and directed on site in a manner that would minimize the potential for spill light. The Project would adhere to the requirements of LAMC Section 14.00 in all respects and will follow all applicable procedures. All applicable performance standards or alternative compliance measures will be addressed and all procedures for review and approval will be followed. LABOE shall ensure the carrying out of the mitigation measure.

AES-O3: Overhead Contact System Poles. The City of Los Angeles shall ensure that design and installation of the OCS poles will be consistent with the surrounding design context. OCS poles shall be designed and installed in compliance with all applicable design guidelines, policies, and development standards. LABOE shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

4.15 Construction

Construction activities for the Project would be managed from a contractor’s office that would be maintained throughout the construction process. The contractor's office may use portable trailers or vacant office space in an existing building. Parking for approximately 20 to 30 vehicles would be needed for construction management personnel and visiting agency or owner representatives and visitors. The location of the contractor’s office will be chosen prior to the start of construction.

Construction activities associated with the Project would affect portions of Grand Avenue, 1st Street, Broadway, 11th Street, Figueroa Street, 7th Street, and Hill Street, as well as the selected MSF and TPSS sites. Construction activities would include pavement removal, utility relocation, excavation, construction of track drains, installation of concrete track slab and rails, construction of station platforms, installation of special track work units, reconstruction of ramps and sidewalks, paving, and striping. Other activities would include installation of specialty system work, such as traction power, overhead contact wire, communications systems, train/traffic signaling, and OCS pole foundations. The remainder of this section offers a typical description of how the construction process would proceed. It should be noted that the actual construction process and schedule will be determined by the contractor at the time of construction; therefore, the information presented below should be regarded as illustrative of similar typical construction processes.
Construction equipment that may be required for the Project would typically include backhoes, small cranes, dump trucks, concrete trucks, paving equipment, rail transporters, bulldozers, graders, cranes, compactors, rollers, drill rigs, paving machines, rail welding equipment, concrete mixers, flatbed trucks, dump trucks to haul dirt, rail installation vehicles, and various hand and power tools. Additional information regarding the construction equipment assumptions is provided in the Air Quality and Climate Change Assessment Report, which is included as Appendix D.

It is estimated that the maximum number of construction workers expected at any one time could be approximately 70 to 75, including utility workers; demolition workers; track workers; paving, sidewalk, and curb workers; construction management; inspectors; and MSF workers.

Laydown and storage area(s) for construction would be established near the Project alignment and would be used for storage of equipment and materials. The laydown and storage area(s) could be located within the right-of-way, in parking lots, or on vacant land, and would be used to store equipment and materials. Four potential laydown and storage areas have been currently identified for evaluation: (1) the southeast corner of 3rd Street and Main Street; (2) northeast corner of 3rd Street and Spring Street; (3) 243 South Spring Street; and (4) Grand Avenue to Olive Street, between 8th Street and 9th Street. However, these should be regarded as example sites, and other locations within the study area may become available and be chosen. All four example locations are currently being used as parking lots adjoining City streets within one block of the Project alignment.

Material removed to make room for the Project and brought in to be installed as part of the Project will use haul routes designated by the LADOT. Potential routes from the north end of the Project could be north along Broadway to enter U.S. 101 or east along 1st Street and then north along Los Angeles Street to enter U.S. 101. From the south end of the Project, a potential route could be west along 11th Street and then south along Los Angeles Street to enter Interstate 10. It should be noted that these routes are illustrative examples; designated routes will be determined by LADOT in consultation with the Project contractor.

Project construction activities would typically take place on weekdays between 7:00 a.m. and 9:00 p.m., in accordance with LAMC Section 41.40(a). To expedite construction, certain construction activities may occur during nighttime, weekend, and holiday periods with the approval of the Board of Police Commissioners pursuant to LAMC Section 41.40(j). In addition, construction within City roadways may occur during peak periods (i.e., 6:00 a.m. to 9:00 a.m. and 3:30 p.m. to 7:00 p.m.) in accordance with Mayor's Executive Directive No. 2 and Bureau of Engineering Special Order No. 001-0406, which provide an exemption to the rush hour roadway construction prohibition for major public works projects having traffic mitigation plans.

Furthermore, construction activities would follow the City of Los Angeles Department of City Planning's policy to maintain safe adjacent pedestrian access at all times during construction.

The analysis in this document assumes that, unless otherwise stated, the Project would be designed, constructed, and operated following all applicable laws, regulations, ordinances, and formally adopted City standards, including but not limited to the LAMC; LADOT design standards and special provisions; California Manual on Uniform Traffic Control Devices; and all City bureaus' design manuals, special provisions, and standard plans, including the latest Standard Specification for Public Works Construction (SSPW or Green Book); the City of Los Angeles Department of Public Works, LABOE Brown Book; the Work Area Traffic Control Handbook; and any FTA requirements.
Utility Relocation

The approach required to handle utilities during construction would depend on the type, length, number, and complexity of the utility to be constructed, protected, or relocated. Utilities in potential conflict with streetcar construction would include, but are not limited to, storm drains, sanitary sewers, water pipelines, power lines, gas pipelines, electrical duct banks, lighting cables, fiber optic lines, telephone, cable lines, and underground conduits for traffic signals and roadway lighting. To the extent possible, the streetcar trackway and facilities would be located to avoid or minimize conflicts with existing utilities.

In addition to relocation of existing utilities, new utilities would be installed as part of the Project, including electrical duct banks, traffic signal conduits, and electrical service lines. Utility relocation is typically the first work item to be performed on a project. Once utility relocation has been completed within a segment, track work and civil construction will commence, and the utility relocation work crews would move on to the next segment. This method of sequencing typically would allow crews to keep utility relocation work proceeding ahead of the track work, and would keep construction activity confined to two segments at a given time.

Track Construction

All tracks and platforms would be located within the public right-of-way. The majority of the tracks would be located within existing traffic lanes, providing a mixed-flow traffic operation. A short segment of Grand Avenue (under the Grand Avenue Extension Design Option) would operate in an exclusive trackway south of 1st Street in order for the operator to stop the vehicle and switch directions safely.

The construction of a trackway within an existing City street would involve the use of embedded track (rails encased in a concrete track slab). Temporary street closures, affecting traffic lanes, driveway access, and bicycle lanes, will be needed. Widely publicized advance notice will be provided to property owners, business owners, tenants, and the general public.

Track work construction would include demolition of the roadway sections being displaced by the track slab, preparation of the track bed, placement of reinforcing-steel (if used), and placement of rails in their exact alignment. Once the rail is positioned using adjustable gauge rods and wrapped with rail boot to minimize stray current leakage, concrete would be poured around the rail and rebar to form the concrete track slab.

It may be possible that precast concrete track panel sections would be used as a method to increase the rate of trackway production. These may be proposed across intersections and other access points that would benefit from a reduced duration of temporary closure.

Construction of station platform foundations, restoration of pavement, and reconstruction of any sidewalks and ramps would begin simultaneously or immediately following the track slab within each segment. Once the track is placed, the pavement is restored, and sidewalks and ramps are reconstructed, the closed roadway lanes could typically reopen to traffic.

Maintenance and Storage Facility

The vehicle MSF would typically be constructed early to midway during track construction to provide the ability to test and store the streetcar vehicles prior to operation. Constructing the MSF may involve a greater level of disruption than that associated with the tracks or stops because it requires excavation; soil remediation, if necessary; street closures; construction staging areas;
traffic control; and utility issues related to building a permanent structure. The MSF would be constructed from standard building materials that would be durable and resistant to vandalism.

**Streetcar Stop Platforms**

The first step of platform construction involves setting forms, installing underground service utilities, and pouring concrete foundations and curbs. The platform surface, along with ramps and steps connecting to the platform, would be constructed next, followed by setting canopies and other platform amenities. Platforms would be constructed from standard building materials that are durable and resistant to vandalism.

**Operating Systems Installation**

This segment of construction would include installation of rail system elements, such as the OCS for streetcar power distribution (i.e., poles and wiring), TPSS, and communication systems.

Systems installation generally follows the completion of track construction. Finishing for platforms usually overlaps with systems work and is completed prior to final testing and pre-revenue operations. Systems installation work is less disruptive to communities than track construction work. Because the work area would be confined to the track area, a minimal number of partial lane closures are anticipated.

**Testing and Start-Up**

This stage includes testing of streetcar operations and communication systems, signal coordination, and personnel training prior to the opening of the streetcar system.

### 4.15.1 No Build Alternative

**Not Adverse.** Under the No Build Alternative, the improvements and facilities associated with the Project would not be constructed. The No Build Alternative represents conditions in the study area that would remain if the Project did not occur. It includes those improvements projected to be funded under the current RTP/SCS. The No Build Alternative also serves as the baseline for comparison and assessment of the Project. Projects included in the No Build Alternative would undergo separate environmental review and potential effects would be determined at that time. There are no construction effects in the No Build Alternative condition that provide helpful context to the EA other than to note that these construction activities would occur without the Project. Therefore, the No Build Alternative would not result in an adverse effect related to construction activities.

### 4.15.2 7th Street Alignment Alternative

**Effect CON-1: Air Quality and Climate Change**

**Not Adverse with Mitigation.** The information presented in this section is based on the Air Quality and Climate Change Assessment Report, which is included as Appendix D. 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 assessment of construction air quality impacts considers each of these potential sources. The equipment mix and duration for each construction stage is detailed in the Road Construction Model and CalEEMod printout sheets are provided in the Air Quality and Climate Change Assessment Report.
The total amount of construction, the duration of construction, and the intensity of construction activity could affect the amount of construction emissions, the concentrations, and the resulting impacts occurring at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner burning construction equipment fleet mix, and/or (2) a less intensive build-out schedule (i.e., fewer daily emissions occurring over a longer time interval).

Criteria Pollutant and Related Regional Emissions. Table 4.15-1 shows the regional construction emissions calculated for the Project. The emission estimates account for implementation of Mitigation Measure AQ-C1, which was required as part of the Project during the CEQA process. Mitigation Measure AQ-C1, as shown below, requires cleaner-burning off-road construction equipment. The SCAQMD significance thresholds are also presented for information, although projects under the purview of the FTA are not required to utilize local significance thresholds.

Table 4.15-1. Worst-Case Regional Construction Emissions (pounds per day)

<table>
<thead>
<tr>
<th>Construction Phase</th>
<th>Pb</th>
<th>ROG</th>
<th>NOX</th>
<th>CO</th>
<th>SOX</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Demolition and Excavation</td>
<td>&lt; 1</td>
<td>11</td>
<td>92</td>
<td>70</td>
<td>&lt; 1</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Drainage /Utilities/Subgrade Work</td>
<td>&lt; 1</td>
<td>7</td>
<td>71</td>
<td>37</td>
<td>&lt; 1</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Track and TPSS Installation, Paving</td>
<td>&lt; 1</td>
<td>3</td>
<td>27</td>
<td>17</td>
<td>&lt; 1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Maintenance Facility Construction</td>
<td>&lt; 1</td>
<td>70</td>
<td>35</td>
<td>21</td>
<td>&lt; 1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Concurrent Track Installation and Maintenance Facility Construction</td>
<td>&lt; 1</td>
<td>73</td>
<td>62</td>
<td>38</td>
<td>&lt; 1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>SCAQMD Significance Threshold</td>
<td>3</td>
<td>75</td>
<td>100</td>
<td>550</td>
<td>150</td>
<td>150</td>
<td>55</td>
</tr>
</tbody>
</table>

Note: Road Construction Emissions Model and CaEEMod modeling output sheets are provided in Appendix D.

Nonetheless, the SCAQMD significance thresholds are used as indicator for an adverse effect. Emissions would be less than the applicable SCAQMD significance thresholds. Therefore, the Project would not result in an adverse effect related to regional emissions.

Local Emissions. In addition to regional emissions thresholds, SCAQMD has developed a set of mass emissions rate look-up tables that can be used to evaluate localized impacts that may result from construction-period emissions. If the onsite emissions from proposed construction activities are below the Localized Significance Threshold (LST) emission levels found in the LST mass rate look-up tables, then project emissions would not have the potential to cause a localized air quality impact.

When quantifying mass emissions for LST analysis, only emissions that occur on site are considered. Consistent with SCAQMD LST guidelines, emissions related to offsite delivery/haul truck activity and employee trips are not considered in the evaluation of localized impacts. A conservative estimate of the Project’s construction-period mass emissions is presented in Table 4.15-2.
Table 4.1-2. Worst-Case Localized Construction Emissions with Mitigation (pounds per day)

<table>
<thead>
<tr>
<th>Description</th>
<th>NOx</th>
<th>PM10a</th>
<th>PM2.5a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worst-case Emissions Prior to Mitigation</td>
<td>94</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Emissions Reduction with Mitigation</td>
<td>(33)</td>
<td>(3)</td>
<td>(2)</td>
</tr>
<tr>
<td>Maximum Emissions with Mitigation</td>
<td>61</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Localized Significance Thresholds b</td>
<td>74</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Threshold Exceeded?</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: Construction Road Emissions Model and CalEEMod output sheets are provided in Appendix D.

a PM10 and PM2.5 emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.
b The Project site is located in SCAQMD Source Receptor Area (SRA) Number 1. These LSTs are based on the site location SRA, distance to nearest sensitive receptor location from the Project site (25 meters), and the study area that could be under construction on any given day (1 acre) that is within 25 meters of any individual sensitive receptor location.

The emission estimates account for implementation of Mitigation Measure AQ-C1, which was required as part of the Project during the CEQA process. Localized emissions would be less than the applicable SCAQMD significance thresholds, which are used as indicator for an adverse effect. Therefore, the Project would not result in an adverse effect related to local emissions.

**Greenhouse Gas Emissions.** Construction of the Project would result in the short-term generation of GHG emissions from combustion exhaust. Using the same methodology as presented for regional emissions discussed above, the Project would result in 1,440 metric tons of GHG emissions. The GHG analysis follows local guidance recommended by the SCAQMD. The SCAQMD suggests amortizing construction-period GHG emissions over the “typical project” useful life span of 30 years and assessing construction emissions together with operational emissions. As such, refer to Section 4.8, Greenhouse Gas Emissions, for a comprehensive GHG and climate change discussion. Based on that analysis, the Project would not result in an adverse effect related to GHG emissions.

**Effect CON-2: Biological Resources**

**Not Adverse with Mitigation.** Migratory birds, including four of the special-status species known to occur in the Los Angeles quadrangle, are protected under the Migratory Bird Treaty Act (MBTA), which provides legal protection for migratory birds, their occupied nests, and their eggs. The areas adjacent to the Project alignment are nearly completely covered with concrete and asphalt; some areas are landscaped with ornamental trees, shrubs, and ground cover. According to local and regional plans, policies, and regulations, the California Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service, an environment of this type is not considered to be suitable habitat for any of the identified candidate, sensitive, or special-status species. Construction activities could result in a temporary or permanent take of a migratory bird, nest, or egg, as a result street tree removal and would constitute a violation of the MBTA. The following standard practice is implemented by LABOE for all projects to protect nesting birds:

- Within seven days prior to any construction activities during the general nesting season for birds (January to September for raptors; March to August for all other bird species), a survey of nesting birds will be conducted by a qualified biologist. Any active bird nests observed during the survey will be mapped on construction plans. Restrictions on construction activities will be implemented in the vicinity of the nest until it is no longer determined to be active. Typically,
300- to 500-foot buffer zone will be designated around an active nest to allow construction to proceed elsewhere, while at the same time minimizing disturbance to the active nest. Once the nest is determined to no longer be active and the young have dispersed, construction would be allowed to proceed within the buffer zone.

The Project would comply with the City of Los Angeles Tree Preservation Ordinance and Tree Preservation Policy. City policy requires all tree removals be replaced on a 2:1 basis for street trees and 4:1 basis for protected private property trees. No protected trees were identified throughout the proposed alignment or at the MSF sites. Replacement trees would be placed as near their original locations as possible. Mitigation Measure BIO-C1 has been included as part of the Project to ensure protection and/or replacement of trees.

Avoidance measures would protect nesting birds and ensure replacement of removed street trees. Therefore, the Project would not result in an adverse effect related to biological resources.

**Effect CON-3: Community Effects**

**Not Adverse.** During the construction period, it is estimated that approximately 74 additional construction workers would come to downtown Los Angeles. However, the number of workers would not substantially change the overall composition of the working or residential population in the area as construction workers would likely commute from other parts of the region only on weekdays and on a temporary basis (i.e., 18 months of active construction before 6 months of testing begins). Refer to Effect CON-9, Land Acquisition, Displacements, and Fiscal Impacts, below, for a discussion of business displacement and associated minimization measures. Construction activity would be short-term and intermittent and would not substantially alter community character or affect the use of public facilities such as parks and libraries. Therefore, the Project would not result in an adverse effect related to community effects.

**Effect CON-4: Cultural Resources**

**Not Adverse with Avoidance, Minimization, and Mitigation.** The information presented in this section is based on the Historic Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project and the Archaeological Resources Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project, which is included as Appendices E and F.

**Archaeological and Tribal Cultural Resources.** During the archaeological field survey, it was observed that the area is paved and developed, with a few open spaces for landscape vegetation. No surficial archaeological resources were observed during the survey. The lack of archaeological resources identified within the study area does not preclude the possibility of identifying subsurface archaeological material during construction activities. Excavation in City streets often uncovers evidence of previous American-era street development, such as utility conduits, old pavement or curbs, and rails and ties from older street rail systems that have been buried in fill and covered with asphalt. However, these items are now usually fragmentary and no longer associated with their original context, and therefore lack integrity. In terms of prehistoric resources, the study area has been heavily disturbed by past construction activities, including the construction and installation of utilities, roads, and skyscrapers. Therefore, the likelihood of encountering intact, subsurface prehistoric archaeological material within the study area is low. Surveys and research did not result in the identification of any surficial prehistoric or historic archaeological sites or features. The Project has a very low potential to disturb, damage, or degrade an archaeological resource or its
setting. Discoveries of human remains would be treated as required by state law, which is ensured by the implementation of Avoidance and Minimization Measure CUL-C2. Therefore, the Project would not result in an adverse construction effect related to archaeological and tribal cultural resources along the streetcar alignment.

TPSS units would require only modest amounts of earth moving during construction. Regarding the two MSF sites, the potential impacts on archaeological and tribal cultural resources during construction would be similar to those for TPSS, except that it would include excavation to more than six feet deep for construction of inspection pits under the streetcars. No surficial archaeological resources were observed during the project survey. Subsurface historical archaeological material that may be found during construction activities likely is not intact and therefore not significant, while the likelihood of encountering intact, subsurface prehistoric archaeological material is low. For these reasons, the potential for impacts on archaeological resources from TPSS units and MSF sites is low. Construction of TPSS units has a very low potential to disturb, damage, or degrade an archaeological resource or its setting. Discoveries of human remains would be treated as required by state law. Archaeological discoveries without prior planning would follow the federal process and requirements set forth in the Section 106 regulations at 36 CFR § 800.13 (b). Therefore, the Project would not result in an adverse construction effect related to archaeological and tribal cultural resources at TPSS unit locations and MSF sites.

**Historical and Architectural Resources.** The following section addresses the proposed project and its potential construction effects on historic properties. Each Project component was considered to determine if the undertaking would alter, directly or indirectly, any of the characteristics of a historic property that qualifies it for inclusion in the NRHP. For any properties within the APE that are listed in or are eligible for inclusion in the NRHP, the Section 106 Criteria of Adverse Effect were applied in accordance with 36 CFR Section 800.5.

With the possible exception of installations within the sidewalk areas, there would be no demolition of a significant resource. All project components would be constructed within the street right-of-way, on non-historic sidewalks, in vacant lots, or in non-historic parking garages. No historic streetlights or “Broadway Rose” streetlight bases would be demolished for the Project. The construction laydown area would be selected by the contractor and will be a parking lot or other type of undeveloped lot with no structures. Avoidance and Minimization Measure AES-C1 would minimize the temporary effects associated with construction laydown areas.

There would be no conversion, rehabilitation, or alteration of a significant resource that does not conform to the Secretary of the Interior’s *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (Secretary’s Standards; 36 CFR 67). Based on the most recent preliminary construction plans (30% design, March 2017) sidewalks would not be damaged or demolished for the proposed project, however, the location of OCS poles is not yet known. There are multiple options for choosing the placement of OCS poles to avoid damaging historic terrazzo sidewalks located within the Broadway District. For example, existing streetlight poles may be utilized to attach the catenaries or the OCS pole placement may be shifted so it is located in non-historic sidewalk areas. OCS poles have a maximum 120 foot spacing requirement, but they may be placed closer together to avoid damaging historic sidewalk material. Along the west side of Broadway, where the proposed alignment is located, terrazzo sidewalks extending the full width of the sidewalk from the building face to the back of curb that are considered character-defining features of the Broadway Theater and Commercial District include those at 533, 601-605, and 609-613 South Broadway. Individually significant historical resources may include these historic sidewalk features, along with brass or ceramic inserts that are unique to that resource. There is also
a possibility that historic sidewalk features may be discovered during construction because they have been obscured over time by a layer of asphalt or concrete. Conditions to prioritize avoidance of historic sidewalk features during final design, and to protect and preserve them in place during construction, would be required. Mitigation measures have also been developed to ensure the terrazzo is avoided when the placement of the OCS poles are located in final design. Avoidance and Minimization Measure CUL-C1 would reduce the potential to cause physical damage to the terrazzo installations, vault lights, basement vault hatch doors, flagpole holders, and utility and ventilation covers that are considered character-defining features of the Broadway Theater and Commercial District, and therefore ensure no substantial adverse change to the significance of the historic district would occur. Avoidance and Minimization Measure CUL-C1 would also ensure that if sidewalk features adjacent to an individually significant historical resource would need to be altered for the Project, such alterations would conform to the Secretary's Standards, and ensure no substantial adverse change to the significance of the historical resource would occur. Should incidental damage occur during construction, the historic sidewalk feature would be repaired or replaced in kind by a qualified contractor in a manner consistent with the Secretary's Standards. In the unlikely event that the sidewalk feature cannot be treated in accordance with the Secretary's Standards, there would still be no adverse effect on the historic building that fronts the sidewalk, and there would be no substantial adverse change in the overall significance of the historical resource because enough contributing features would remain that the historical resource would retain its designation.

There would be no construction that reduces the integrity or significance of important resources on the site or in the vicinity. Some construction activities associated with the Project could result in an increase in ground-borne vibration. Mitigation Measures NV-C12 through NV-C16, discussed below, include preconstruction surveys to identify at-risk historical resources, vibration limits, vibration monitoring, and alternative procedures that would lower vibration levels. These measures would minimize potential adverse vibration effects.

The construction of TPSS units would not impact historic buildings. Temporary changes that would occur during the construction period would not substantially degrade the visual character or quality of the area within the project viewshed. The MSF located at Broadway and 2nd Street would be located on a parking lot that currently has two commercial buildings that would be demolished for the proposed MSF. These two buildings are not historic properties. The MSF located at 11th and Olive Street (East) would be located on a parking lot that currently does not have structures. In addition, no historic properties are located adjacent to either MSF. MSF operational activities would not impact an historical resource. The construction of the TPSS units and the MSF would not impact historic properties because:

- There would be no demolition of a historic property to accommodate construction of the MSF.
- There would be no relocation of a historic property to accommodate construction of the MSF.
- There would be no conversion, rehabilitation, or alteration of a historic property that would result from construction of the MSF.
- There would be no construction of the MSF that reduces the integrity or significance of historic properties on the site or in the vicinity.

Using the above analysis, the criteria of adverse effect is applied to the undertaking's potential effects on historic properties in the APE. As set forth in 36 CFR 800.5(a)(1), "an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the [NRHP] in a manner that would diminish the
integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the [NRHP]. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.”

Examples of adverse effects are set forth in 36 CFR 800.5(a)(2) and an analysis of potential construction effects of the undertaking relevant to those examples is provided below.

**(viii) Physical destruction of or damage to all or part of the property**;

With the exception of the TPSS, MSF, and construction laydown area, all Project components would be constructed within the street right-of-way or on sidewalks. TPSS units would be constructed on either non-contributing vacant lots within the Broadway Theatre and Commercial District, or within non-contributing or non-historic parking garages. The MSF would be constructed on parking lots with no structures. The construction laydown area would be constructed on parking lots with no structures. Because the exact location of the construction laydown area has not yet been chosen, conditions have been stipulated by which to avoid the physical destruction or damage to historic properties.

Based on the most recent preliminary construction plans (30% design, March 2017) sidewalks would not be damaged or demolished for the Project, however, the location of OCS poles is not yet known. There are multiple options for choosing the placement of OCS poles to avoid damaging historic terrazzo sidewalks located within the Broadway District. For example, existing streetlight poles may be utilized to attach the catenaries or the OCS pole placement may be shifted so it is located in non-historic sidewalk areas. OCS poles have a maximum 120 foot spacing requirement, but they may be placed closer together to avoid damaging historic sidewalk material. Along the west side of Broadway, where the proposed alignment is located, terrazzo sidewalks extending the full width of the sidewalk from the building face to the back of curb that are considered character-defining features of the Broadway Theater and Commercial District include those at 533, 601-605, and 609-613 South Broadway. Avoidance and Minimization Measure **CUL-C1** would ensure the terrazzo be identified and material be preserved in place and not destroyed or damaged during construction. As a result, historic sidewalk material that contributes to the Broadway District would be preserved in place and not destroyed or damaged during construction. In accordance with 36 CFR § 800.5(b), a finding of “no adverse effect” may be proposed if “conditions are imposed, such as the subsequent review of plans for rehabilitation by the [SHPO] to ensure consistency with the Secretary’s [of the Interior] Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines, to avoid adverse effects.” Avoidance and Minimization Measure **CUL-C1** was developed to impose appropriate conditions on the proposed project to ensure there would be no adverse effect on the historic sidewalks of the Broadway Theater and Commercial District.

Some construction activities associated with the Project could result in an increase in ground-borne vibration. The potential exists for vibration to be transmitted into buildings because of underground structures in the Project area, such as basements, loading docks, and parking garages. As discussed below, Mitigation Measures **NV-C12** through **NV-C16** would lower vibration levels and minimize the potential for damage to
buildings by vibration, by requiring pre-construction surveys to identify at-risk historic properties including an inspection and photographs of existing conditions, setting vibration limits, requiring vibration monitoring, proposing alternative procedures that would lower vibration levels, use of a resilient mat installed under the trackbed or comparable design measure, and the hiring of a Mitigation Coordinator. The contractor would be required to abide by the measures; these measures would reduce the potential for destruction of or damage to a historic property by vibration. Operational vibration would be similar to levels generated by the historic LARy and Pacific Electric streetcar systems that formerly operated along the downtown streets, and would have no effect on the historic buildings that formerly were exposed to streetcar generated vibration.

Finding: Avoidance and Minimization and Mitigation Measures CUL-C1 and NV-C12 through NV-C16 would ensure there would be no adverse effect resulting from physical destruction of or damage to all or part of a historic property.

(ix) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

Finding: No property listed in or determined eligible for listing in the NRHP would be subject to alterations that would be inconsistent with the Secretary's Standards for the Treatment of Historic Properties. There is no intention to use former streetcar catenary wire anchor hooks on any of the buildings that are historic properties. All Project components would be constructed within the street right-of-way, on sidewalks, in vacant lots, or in non-historic parking garages. Avoidance and Minimization Measures CUL-C1 and CUL-O1 would ensure consistency of repairs with the Secretary's Standards.

(x) Removal of the property from its historic location;

Finding: No property listed in or determined eligible for listing in the NRHP would be removed from their historic location as a result of the construction of the Project. All Project components would be constructed within the street right-of-way, on sidewalks, in vacant lots, or in non-historic parking garages. No removal of historic properties or contributing features of historic properties is expected, based on the Project description and construction memo.

(xi) Change in the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

Finding: No historic property would suffer a change in the character of its use and no physical features within a property's setting that contribute to the historic significance of a property would be changed. All Project components would be constructed within the street right-of-way, on sidewalks, in vacant lots, or in non-historic parking garages. No physical features, such as the contributing buildings and the terrazzo sidewalks in the Broadway Theatre and Commercial District, are subject to conversion in use.

(xii) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
Visual Elements

The proposed station stops/platforms, MSF sites, the OCS, and TPSS units would not introduce visual, atmospheric, or audible elements that would diminish the integrity of a historic property’s significant historic features. The Project would be constructed in the street right-of-way, and the streetcar would operate within the street right-of-way. Platforms would be constructed in the street right-of-way. The OCS would be constructed on sidewalks with no character-defining features. No TPSS would be constructed on parcels with historic properties; within the Broadway Theatre and Commercial District, TPSSs would be constructed on either non-contributing vacant lots within the Broadway Theatre and Commercial District, or within non-contributing or non-historic parking garages.

Atmospheric or audible elements

Effects of audible elements are discussed under operations.

Finding: As described later in this report, Avoidance and Minimization Measure AES-O1 would ensure that all TPSS structures would be designed to minimize their visual presence and AES-O3 will ensure that design and installation of the OCS poles will be consistent with the surrounding design context.

(xiii) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or native Hawaiian organization;

Effects of neglect discussed under operations.

(xiv) Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Finding: No property listed in or determined eligible for listing in the NRHP would be transferred, leased, or sold out of federal ownership or control as a result of the Project. There are no known historic properties within the APE owned by the federal government.

The above analysis demonstrates that construction activities would not impact historic or architectural resources. Therefore, with mitigation, the Project would not result in an adverse construction effect related to historic or architectural resources along the Project alignment, at TPSS unit locations, or at MSF sites.

Effect CON-5: Energy Resources

Not Adverse. Together, construction of the MSF, TPSS, and energy distribution infrastructure would require the consumption of approximately 265 million BTUs per 5-day workweek. However, energy use during construction would be temporary and would be controlled and managed so as to not be wasteful, inefficient, or unnecessary. Construction contractors would comply with Section 11000, Part 1, of the Bureau of Engineering Master Specifications, which requires all equipment and products to be operated in accordance with manufacturer’s published recommendations as well as commercial standards established by professional organizations including, but not limited to, the American Society for Testing and Materials, the American National Standards Institute, and the American Society of Mechanical Engineers. No applicable energy standards would be violated. Additionally, construction debris and waste would be recycled, resulting in life-cycle energy savings.
Diesel fuel would be the source of the vast majority of energy that would be consumed during the construction period. Given the extensive network of fueling stations and the fact that, on average, less than 400 gallons of diesel fuel would be required per day, construction of the build alternatives would result in a negligible reduction in regional diesel fuel supplies and no new or expanded sources of energy or infrastructure would be required to meet construction energy demands.

The increased fuel use and BTU consumption is not considered a wasteful or inefficient use of non-renewable resources as the fuel is being used to construct a mass transit system, which has been identified by FTA as an efficient method of reducing energy use. Therefore, the Project would not result in an adverse effect related to energy.

**Effect CON-6: Environmental Justice**

**Not Adverse.** Construction of the Project would not physically displace EJ population or EJ businesses within the vicinity of the Project. Construction would be primarily located within the public street rights-of-way (with the exception of the TPSSs, MSF, and laydown/storage areas). Refer to Effect CON-3, Community Effects, for a discussion regarding construction effects to the community and Section 4.9, Land Acquisition, Displacements, and Fiscal Impacts, for a discussion of business displacement and associated minimization measures. Construction activity would be short-term and intermittent along the Project alignment and would not disproportionately affect EJ communities. Therefore, the Project would not result in an adverse effect related to EJ populations and businesses.

**Effect CON-7: Geology, Soils, and Seismicity**

**Not Adverse with Mitigation.** Construction would involve subsurface activities (e.g., relocation, modification, or protection of utilities; constructing the foundation for the MSF; laying tracks). With the exception of these activities, which would occur only during construction, all facets of the Project would occur at or above the existing grade and present only negligible risks to the underlying geology of the area. Construction activities would not occur within or adjacent to an Alquist-Priolo Special Study Zone Area or Fault Rupture Study Area. Although its precise location is unknown because of its position deep below the surface, the closest fault to alignment is the Elysian Park thrust, which is approximately 2.5 miles to the north. Numerous additional faults are located within 10 miles and in the region at large. All modifications of roadways would be consistent with the Bureau of Engineering Street Design Manual. Compliance with building seismic codes and occupational safety and health laws and regulations would also reduce risks to project structures, workers, and the public. Given the distance from identified faults, there is a negligible risk of disturbing faults or changing regional or local seismic and geologic conditions in a way that would result in property damage or risk of injury or death.

The northern portion of the alignment would be located in an area identified as susceptible to liquefaction. Mitigation Measure GEO-1 would require a geotechnical report to be prepared prior to final design. The report would address potential consequences of liquefaction and soil strength loss; provide an estimate of settlement, lateral movement, and the foundation’s soil-bearing capacity; and discuss mitigation measures, which could include design requirements.

Landslides have occurred adjacent to Bunker Hill; however, the area identified as susceptible to landslides by the state has been developed as a high-rise senior housing complex since the late 1970s. Furthermore, the hillside was graded in compliance with local regulations during construction of Angelus Plaza and the risk of landslides resulting in loss, injury, or death would be
minimal. Therefore, it is unlikely that the Project would contribute to landslides. In addition, the setback distance of the identified landslide area from the Project alignment reduces the likelihood of a landslide that would affect construction of the Project.

The study area is underlain by soil types that are not known to have expansive properties. Construction activities would not introduce new expansive soils or otherwise adversely modify soil types underlying the project footprint that could increase the expansive soil impacts in the project area.

Based on the above analysis, the Project would not result in an adverse effect related to geology, soils, and seismicity.

**Effect CON-8: Hazardous Materials**

Not Adverse with Mitigation. This section addresses the potential for the Project to expose people and the environment to hazards and hazardous materials during the construction process. Hazardous materials information in this section is based primarily on the *Phase I Environmental Site Assessment* (ESA) (July 2013) and the Phase I ESA for the South Park East MSF Site (May 2015). Both of the Phase I ESAs are included in Appendix K.

Given the mixed land uses in the area, the configurations, construction types, and sizes of the buildings vary, depending on the type of development (e.g., residential, commercial, retail) and the date of construction. In addition to the buildings, numerous paved parking lots are located within the study area. Subsurface utilities that are typical of urban development are also located within the study area as well as subsurface petroleum exploration, production, and distribution facilities. A site reconnaissance survey of the study area was conducted on August 15 and 16, 2012; the survey did not identify other sites of concern. No indications of large scale spills or hazardous material usage or disposal were identified within the study area. No pits, ponds, lagoons, or other indications of buried or large-scale hazardous material deposits were identified during the reconnaissance.

An environmental records search of federal, state, local, and proprietary databases was conducted as part of the Phase I ESA. The database report contains a map and information regarding pertinent environmental records for the study area. The database search report identified 494 environmental listings within the study area or the one-eighth-mile surrounding vicinity. According to the evaluation, 68 records correspond to 37 sites that are considered to be of concern to the Project.

A one-quarter-mile buffer zone surrounding the project area was evaluated for purposes of the *Environmental Data Resources* (EDR) search radius. The EDR database search identified 507 regulatory listings within the one-quarter-mile buffer zone of the study area. A total of 120 regulatory listings were located within one-eighth of a mile of the study area. A total of 40 regulatory listings associated with 27 sites were identified adjacent to, previously adjacent to, or in the general vicinity (i.e., one-tenth of a mile) of the MSF sites.

Ten additional sites of concern were identified from reviews of historical resources (e.g., Sanborn fire insurance maps, historical aerial imagery, and City directories). The sites are considered to be of concern given the likelihood for USTs or other historic hazards to have been on the sites previously. The Phase I ESA in appendix K identifies Recognized Environmental Conditions (RECs), including hazardous substances are defined in the federal *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), underground storage tanks (USTs), leaking underground storage tanks (LUSTs).
Existing buildings within the study area consist largely of multi-story office, commercial, residential, and retail buildings. Commercial warehouses are also present. Building construction dates back to the late 1920s. Given the historic industrial uses in the study area, there is potential for construction to uncover contaminated soils. It is possible that workers could encounter buried tracks from the past operation of streetcars, a possible source of soil contamination from creosote-contaminated railroad ballast. The removal of contaminated soil and other hazardous wastes may pose a hazard to construction workers and the surrounding population if improperly managed. Construction of the Project could result in adverse effects related to the excavation and disposal of hazardous materials prior to mitigation. Mitigation Measures HM-C1 through HM-C6 related to the treatment and disposal of soils would minimize potential adverse effects. Furthermore, haul route trucks would comply with the City's Notification of Hazardous Substances General Conditions.

Given that groundwater is found at depths of 30 to 50 feet below ground surface in the project vicinity, it is unlikely that groundwater would be encountered during construction. Groundwater could be contaminated given the past industrial uses in the area. Mitigation Measures HM-C7 through HM-C8 related to groundwater would minimize potential adverse effects.

Although unlikely, construction activities have the potential to result in the release of hazardous materials (e.g., fuel leaking from equipment or contaminated soil spilling during transport). The transport of such materials would involve potential exposure risks to construction workers and to the general public along roadways, including several schools located along the alignment. Mitigation Measures HM-C1 through HM-C8 would minimize potential adverse effects.

The TPSS installation process would involve utility work below grade. In addition, the Phase 1 ESAs identified several RECs with either moderate or high risks located in proximity to both MSF sites. Unidentified USTs and/or other RECs may require removal and the handling of contaminated soil. Mitigation Measure HM-C1 requires a Preliminary Site Investigation (PSI). The PSI will specify the procedures for dealing with USTs located in proximity to the TPSS locations, which would involve testing and stockpiling soils with readings exceeding 50 parts per million (ppm) for volatile organic compounds (VOCs). Mitigation Measures HM-C6 through HM-C12 would also minimize potential adverse effects related to contaminated soils encountered during TPSS and MSF construction activities.

In addition to being located in proximity to RECs, the 11th Street and Olive Street (East) MSF site is located within a methane zone, according to the City’s Zone Information and Map Access System (Version 3.0.1263 (d105)). Construction of this MSF site would comply with all applicable local regulations, including those related to methane, as specified in the Division 71 of the City of Los Angeles Building Code, which would minimize potential adverse effects.

Based on the above analysis, the Project would not result in an adverse effect related to hazardous materials.

**Effect CON-9: Land Acquisition, Displacements, and Fiscal Impacts**

**Not Adverse with Mitigation.** Many transit projects require construction easements for the temporary staging of equipment and materials during construction. Property used temporarily during construction is returned to the property owner once construction is complete. Construction activities would not require additional land acquisition or displacement beyond those properties identified for Project implementation. It is possible that temporary use of vacant or open parcels could be used for purposes of laydown and storage areas, while construction is underway. The Project contractor would be the acquiring party and would make independent arrangements with
the property owners for the use of their properties. No displacements are anticipated. The individual sites for each of the TPSS installations and also either of the two candidate MSF sites would be acquired prior to beginning construction.

Construction activities would have temporary economic effects. One temporary effect would be the increase in economic activity due to spending (i.e., purchases of goods and services required for construction and employment of workers needed for construction). The increased economic activity would prompt secondary economic activity as a portion of the construction-related revenue and employee compensation is re-spent in sectors throughout the local and regional economy. The extent of the economic effect of construction-related expenditures on the local and regional economy would depend largely on the proportion of construction expenditures that would occur in the local and regional area and on the residential location of persons employed by the construction contractors. It is anticipated, that the capital expenditure for the project would yield approximately 1,900 annual jobs throughout the region. Of these there would be approximately 100 annual construction jobs directly associated with the Project.

It is expected that the size of the regional labor force is sufficient to construct the Project and the regional labor force would likely benefit. State and local governments would benefit from income taxes paid on the project construction force wages. However, the magnitude of the construction activities is relatively small compared to regional construction activities and so it is not expected that the labor expenditures would result in net new expenditures for construction labor. Therefore, it is unlikely that state and local governments would see a substantial increase in income tax revenues.

The purchase of materials and supplies would include gravel, asphalt, concrete, track rails, and architectural materials for the station structures, and signage. Most of these materials and supplies would be expected to be purchased within Los Angeles County, and where not, most likely within the Southern California region. The purchase of these materials and supplies would include the payment of sales tax, which would be revenue distributed to the state and local governments. The amount of materials and supplies required for the proposed project, however, is relatively small compared to all construction projects that would be ongoing in the region. As such, it is unlikely that the state or local governments would see a substantial increase in sales tax revenues.

For business owners and commercial property owners, the disruption of construction activities would similarly involve multiple construction crews operating along the corridor simultaneously. Construction activities would inconvenience and disturb area employees, business operations, and business customers. Temporary construction effects would include:

- Presence of construction workers, heavy construction equipment, and materials
- Use of short-term reduction in number of roadway travel lanes, road closures, traffic diversions, and modified access to properties
- Loss of parking, especially on-street parking
- Increase in airborne dust
- Increase in noise and vibration from construction equipment and vehicles
- Decreased visibility and change in customer access to businesses

Mitigation Measure **ECON-C1** would minimize impacts to business by requiring business access and informational signs. In addition, Mitigation Measure **ECON-O1** ensures compliance with the Uniform Act and displacement assistance. The Construction Traffic Management Plan Mitigation Measure **TRAF-C1** would alert nearby businesses to temporary closures, and detours and maintain access during business hours. Temporary economic effects during construction would not be considered
adverse. Therefore, the Project would not result in an adverse effect related to land acquisition, displacements, and fiscal impacts.

**Effect CON-10: Land Use and Planning**

**Not Adverse.** Proposed construction activities would generally occur within the public street rights-of-way (with the exception of the TPSSs, MSF, and laydown/storage areas) and would follow all applicable City of Los Angeles regulations and guidelines pertaining to construction, which would minimize the potential for adverse effects and conflicts with land use plan policies. Construction activities not within public streets, including TPSS unit and MSF sites, would adhere to applicable City of Los Angeles regulations and requirements. In addition, the Project would coordinate its streetscape components to be consistent with the simple, clean-lines objectives in the BSMP. Construction impacts would be temporary and short term; they would occur in a sequential manner along the Project alignment. Because the impacts would be temporary, they would not affect permanent changes that would alter or compromise the plans, policies, or regulations governing the project area. Some portions of existing and planned bicycle lanes would be closed while construction is occurring; those locations would be restored to service as construction moves on to the next location. Construction contractors will be required to coordinate with LADOT to provide detour routes (to the extent practicable) and notify bicyclists of the construction schedule. Bicycle travel would be maintained during the construction period to the extent practicable, consistent with maintaining public safety. Therefore, the Project would not result in adverse effects related to consistency or compatibility with land use plans.

**Effect CON-11: Noise and Vibration**

**Not Adverse with Mitigation.** The information presented in this section is based on the *Noise and Vibration Technical Report for the Restoration of Historic Streetcar Service in Downtown Los Angeles Project*, which is included as Appendix H.

**Noise.** Construction of the Project has the potential to result in substantial, but temporary, increases in local noise levels along the Project alignment. Under normal circumstances, construction activities would occur during daytime and evening hours, because the *City of Los Angeles Noise Ordinance* (LAMC Chapter IV, Article 1; Section 41.40) allows construction only between 7:00 a.m. and 9:00 p.m. on weekdays and between 8:00 a.m. and 6:00 p.m. on Saturdays, unless a variance is obtained. However, it is possible that nighttime construction may also be required. Nighttime activities would require a variance to Section 41.40 of the LAMC for work scheduled after 9:00 p.m. or before 7:00 a.m. weekdays, after 6:00 p.m. or before 8:00 a.m. on Saturdays, or anytime on Sunday.

Construction noise levels would depend on the construction activity, type of equipment, number of pieces of equipment operating, general condition, length of time each piece would operate per day, the presence or absence of noise-attenuating features such as walls or other intervening structures, and the location of construction noise sources relative to sensitive receivers. Table 4.15-3 shows the maximum estimated noise levels that would be generated by the construction equipment at 50 feet during the various stages and the estimated duration of construction. Utility relocation and track construction are anticipated to be the loudest stages of construction. Individual construction activity levels range from a low of 74 dBA to a high of 90 dBA, measured at 50 feet from the equipment, whereas ambient levels were measured at 63 to 74 dBA. Construction activity would be short-term and intermittent and located within a dense urban environment with many existing sources of noise.
In addition, Mitigation Measures NV-C1 through NV-C11 would minimize potential impacts. Therefore, the Project would not result in an adverse effect related to noise.

Table 4.15-3. Construction Activity and Equipment Typical Noise Levels (dBA) at 50 feet

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
<th>Dozer</th>
<th>Backhoe</th>
<th>Grader</th>
<th>Excavator</th>
<th>Crane</th>
<th>Paver</th>
<th>Roller</th>
<th>Generator</th>
<th>Compactor</th>
<th>Welding Machine</th>
<th>Pavement Breaker</th>
<th>Concrete Diamond</th>
<th>Dump Truck</th>
<th>Utility Truck</th>
<th>Concrete Truck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Zone Staging</td>
<td>24</td>
<td>--</td>
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<tr>
<td>Rail Storage</td>
<td>6–12</td>
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<td>76</td>
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<tr>
<td>Site Preparation and Utility Construction</td>
<td>12–18</td>
<td>82</td>
<td>78</td>
<td>85</td>
<td>81</td>
<td>81</td>
<td>80</td>
<td>77</td>
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<td>83</td>
<td>74</td>
<td>89</td>
<td>90</td>
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<td>81</td>
<td>78</td>
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<tr>
<td>Track Construction</td>
<td>12–18</td>
<td>82</td>
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<td>85</td>
<td>81</td>
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<td>78</td>
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<tr>
<td>Station Platform Construction</td>
<td>6–12</td>
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<td>81</td>
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<td>76</td>
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<td>78</td>
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<tr>
<td>TPSS Installation</td>
<td>3–6</td>
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<td>85</td>
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<td>78</td>
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<tr>
<td>OCS Installation</td>
<td>3–6</td>
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<td>78</td>
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<tr>
<td>MSF Construction</td>
<td>12–15</td>
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<td>78</td>
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<td>76</td>
<td>81</td>
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</tbody>
</table>

Source: ATS Consulting 2016.

**Vibration.** Some construction activities, such as compaction, pavement breaking, and the use of excavators, could result in perceptible levels of ground-borne vibration. FTA damage risk vibration limits are shown in Table 4.15-4, and construction activities would not be expected to generate vibrations that would approach the limits. Because fragile buildings, which would be potentially susceptible to vibration damage (Category IV), may be present in the study area, the use of bulldozers and hoe rams would be restricted from operating any closer than 21 feet from the building. In addition, with implementation of Mitigation Measures NV-C12 through NV-C16, vibration levels would remain below the peak particle velocity of 0.12 inches per second for buildings that are extremely susceptible to vibration damage, and below 0.50 inches per section for reinforced concrete, steel, or timber (no plaster) buildings. Therefore, the Project would not result in an adverse effect related to vibration damage.
Table 4.15-4. FTA Damage Risk Vibration Criteria

<table>
<thead>
<tr>
<th>Building Category</th>
<th>Peak Particle Velocity (inch/second)</th>
<th>Approximated Vibration Level, VdB</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Reinforced concrete, steel, or timber (no plaster)</td>
<td>0.5</td>
<td>102</td>
</tr>
<tr>
<td>II. Engineered concrete and masonry (no plaster)</td>
<td>0.3</td>
<td>98</td>
</tr>
<tr>
<td>III. Non-engineered timber and masonry buildings</td>
<td>0.2</td>
<td>94</td>
</tr>
<tr>
<td>IV. Buildings that are extremely susceptible to vibration damage</td>
<td>0.12</td>
<td>90</td>
</tr>
</tbody>
</table>


The use of construction equipment that would produce high levels of vibration, such as hoe rams, large bulldozers, jack hammers, and load trucks, if occurring within 20 feet of Category 2 land uses and 16 feet of Category 3 land uses, could exceed the FTA ground-borne noise impact thresholds for annoyance for transit operations inside the sensitive receivers. However, the airborne noise from construction equipment transmitted from the outside to the inside of buildings is more likely to be higher than the ground-borne noise generated by the vibration at the interior of these land uses. As airborne noise from these construction activities would be restricted to the noise level limits of the Los Angeles Noise Ordinance of 75 dBA during the hours of 7:00 a.m. to 9:00 p.m. weekdays, the vibration effects would not be regarded as adverse. The use of hoe rams and bulldozers within 50 feet of “special” land uses, such as theaters and concert halls, may be audible as ground-borne noise in the interior of buildings. Mitigation Measures NV-C12 through NV-C16 would minimize vibration levels from construction activities. High-vibration construction equipment would be used only intermittently; its use can therefore be scheduled so that it does not overlap with sensitive activities inside buildings. Therefore, the Project would not result in an adverse effect related to vibration annoyance.

Effect CON-12: Safety and Security

Not Adverse. Construction activities would include temporary storage of equipment within the staging areas and segments of the Project alignment under construction. Such machinery would be fully separated from vehicular traffic by a barrier and from pedestrian traffic by a fence. Installation of the OCS would include the use of small cranes, bucket trucks, and other equipment for installation of the wires along the alignment. During the times that wires are strung at cross streets, partial street closures of a few hours duration would be anticipated. Placement of physical buffers between construction activities and users of the transportation network would increase construction safety, and 24-hour private security and nighttime security lighting would be implemented to deter potential criminal activities along the alignment.

The LAPD and LAFD would continue to provide emergency services to residences and businesses throughout the construction period, with at least one access point open to traffic (if the residence or business has others that may be closed). For businesses with single access points, the access point may be maintained through the use of temporary detours, steel plates, and half-closures of driveways. To the extent feasible, full lane closures would take place during nighttime hours, but emergency access would be maintained. Although traffic operations at intersections adjacent to construction activities may deteriorate as a result of the reduced capacity, the Construction Traffic Management Plan identified in Mitigation Measure TRAFF-1 would involve prior notification of construction activities to emergency service providers, allowing first responders to access
properties via alternate routes. It should also be noted that dedicated security services to Metro is
provided by the LASD Transit Services Bureau for Metro operation activities and not construction.

Based on the above analysis, the Project would not result in an adverse effect related to security and
safety hazards.

Effect CON-13: Transportation and Traffic

Not Adverse with Mitigation. Construction activities could temporarily reduce intersection
capacity, as temporary lane closures would be required along the alignment for utility relocation,
track-laying, and OCS installation activities. Project construction activities would typically take place
between the hours of 7:00 a.m. and 9:00 p.m. in accordance with LAMC Section 41.40(a). To expedite
construction activities, certain construction activities may occur during nighttime, weekend, and
holiday periods with the approval of the Board of Police Commissioners pursuant to LAMC Section
41.40(j). In addition, construction within City roadways may occur during peak hours (i.e., 6:00 a.m. to
9:00 a.m. and 3:30 p.m. to 7:00 p.m.) in accordance with the Mayor's Executive Directive No. 2 and
Bureau of Engineering Special Order No. 001-0406, which contain an exemption to the rush hour
roadway construction prohibition for major public works projects with traffic management plans.
Construction would comply with applicable provisions of the LAMC, the latest Standard Specifications
for Public Works Construction (SSPWC or GreenBook), the LABOE BrownBook, and the Work Area
Traffic Control Handbook.

To the extent practicable, traffic lanes would be kept open in both directions on two-way roadways
and in one direction on one-way roadways, particularly during periods of peak traffic operations.
Where space is available, a minimum of one traffic lane and a left-turn pocket would be provided.
Construction vehicles may enter and exit the general traffic lanes, with flaggers, in the areas of
construction. Short-duration lane closures, predominantly on one side or the other of the work zone,
would be required for delivery of materials and during concrete pours. Since the work zone would be
confined within the track area, partial lane closures are anticipated only for short segments and
would be limited to non-peak hours. Access to residences and businesses would be maintained
throughout the construction period, by leaving at least one access point open to traffic. For
businesses or residences with single access points, such access points would be maintained through
the use of temporary detours, steel plates, and half-closures of driveways. To the extent feasible, full
road closures, when and if required, would take place during the night hours.

Designated haul routes for trucks would be identified prior to construction and would be selected to
minimize noise, vibration, and other potential adverse effects. Because construction work would
occur in the downtown area, it is anticipated that trucks would travel from the excavation site to the
nearest freeway ramp and use the adjacent freeways to haul away the excavated material. During
the construction period, approximately 10 to 15 trucks per day are currently estimated to be
required to haul away materials or for utility relocation and MSF excavation. Following completion
of the Project, if physical damage to the haul route roads is found, the roads would be treated as
deemed necessary.

Decreases in capacity due to temporary lane closures would result in an increase in delay and a
deterioration in LOS, particularly when construction activities are close to intersections that are
operating at LOS D or worse during the Project opening-year (early 2021). Impacts would be short-
term and generally limited to two to three weeks for each affected roadway, to accommodate the
linear sequencing of utility relocation and track installation work. However, Mitigation Measure
TRAF-C1 requiring a Construction Traffic Management Plan and Mitigation Measure TRAF-C2 requiring construction mitigation monitoring, would minimize traffic effects.

Pedestrian access would remain open along the sidewalk, and temporary ramps and walkways would be provided by the contractor to maintain ADA accessibility at intersections and crosswalks. Dedicated bicycle lanes that could be affected by work zones would be kept open, to the extent practicable and safe, as determined by the LADOT. Closure of such lanes, where needed, would be kept to a practical minimum and reopened when construction activity moves on to the next segment. Bicycle travel would be maintained during the construction period in the open traffic lanes, or in some cases through the use of temporary detours. Bus lines that would be affected by lane closures due to construction activities would continue to operate, where feasible, in the remaining traffic lanes. A minimum of one traffic lane would be provided, and left-turn pockets would be provided where room is available. During the night hours, when temporary full lane closures are anticipated, bus lines would be re-routed to adjacent streets in a manner that minimizes the inconvenience to bus passengers. If a block is closed that includes a bus stop, the bus stop would be temporarily relocated to the portion of the street segment that is open to bus service. Before any major rerouting changes are made as result of the Project, fliers would be provided on buses or posted at stops at least two weeks in advance to notify riders of route modifications. In addition, hoods would be placed over bus stop signs, also notifying riders of what modifications have been made to the bus route. Delays associated with lane closures would affect public transit vehicles if services cannot be rerouted. Communication with the public would be part of outreach efforts occurring as part of the Construction Traffic Management Plan as identified in Mitigation Measure TRAF-C1 prior to the initiation of construction work zones.

It may be necessary to prohibit on-street curb parking when traffic lanes are closed due to construction activities. Existing parking meters affected by construction would be removed or covered as directed by the LADOT. Contractors would be required to have employees park off-street at City-approved locations to minimize the temporary loss of on-street parking. There may be some inconvenience associated with a reduction of on-street parking spaces. The temporary removal of on-street parking along the Project alignment would not substantially alter the overall availability of parking in downtown and no adverse effect to parking would occur.

Based on the above analysis, the Project would not result in an adverse effect related to transportation and traffic.

Effect CON-14: Visual Quality

Not Adverse with Mitigation. Under the Project, construction would be expected to occur over a 24-month period. Construction-period effects would include below-ground utility relocation and protection activities along Project alignment streets, as well as related trenching, and street circulation-related detours. Additionally, some street trees may be trimmed or removed. Construction-period effects also would include excavation in Project alignment streets, the installation of new drainage systems, the pouring of concrete for station platforms, and the installation of new sidewalk paving where curbs are proposed for extension, as well as paving to match existing road surfaces. These activities would necessitate the narrowing or closing of segments of alignment streets. Intersection construction associated with this component of the construction process would potentially take place during either daytime or nighttime hours. Active construction areas would be primarily within street rights-of-way and would have construction signs and barricades to delineate the work zone.
If construction occurs during nighttime hours, that would serve to reduce visual effects because potentially far fewer visually sensitive viewers would be present. In segments of the alignment adjoining residential uses, views of visual resources would typically be accessible but far less discernible to sensitive viewing groups at night. With the exception of nighttime skyline views across the downtown, most ordinary views during daylight hours would be far less detailed and vivid at nighttime. In those areas where nighttime entertainment venues are clustered, such as along portions of Broadway and Figueroa Street adjoining the LASED, temporary adverse visual effects during the construction period could be greater at night as a result of the Project.

Related logistical support activities would include establishing staging areas for the laydown and storage of construction materials and for overnight parking of construction equipment. Such staging areas would range in size and would be located adjacent to other compatible industrial or commercial land uses or on large surface parking lots to the extent practicable. Actual laydown area locations will be determined prior to initiating construction.

In order to minimize views of stockpiled materials and idle construction equipment at the MSF and in staging areas, and to reduce visual clutter and disorder, Project construction staging areas would be enclosed or screened from view at the street level with appropriate screening materials. The contractor would provide daily visual inspections to ensure the immediate surroundings of construction staging areas are free from construction-related clutter and to maintain the areas in a clean and orderly manner throughout the construction period.

The various construction activities would be of temporary duration and would be governed by City, state, and federal regulations and standards designed to minimize their potential to affect adjacent sensitive uses in adverse ways. Avoidance and Minimization Measures AES-C1 and AES-C2 would control staging areas and night lighting. Therefore, the Project would not result in an adverse effect related to visual resources.

**Traction Power Substations.** Given the relatively small size of the TPSS units, their proposed locations, and the temporary nature of construction activities, construction-period effects associated with the TPSS would not be adverse.

**Maintenance and Storage Facilities.** Construction of the MSF, at either of the two candidate sites, may involve a greater level of disruption on a temporary basis than the tracks or platforms for streetcar stops. Larger scale public works activities have commonly occurred along downtown streets over the years and are expected to be a part of the related downtown improvement projects, including the Figueroa Corridor Streetscape Project and BSMP.

Though temporary visual disruptions are expected, contractors would use best management practices to further reduce and/or avoid adverse aesthetics impacts during construction. Construction contractors would use appropriate screening (i.e. temporary fencing with opaque materials) to buffer views of construction equipment as well as materials and soil in construction staging areas. Site managers would conduct regular site inspections to ensure that staging areas are clean and orderly, to the extent practicable, and that construction debris is removed from public rights-of-way and adjacent properties/roadways. In compliance with the LAMC, graffiti would be promptly removed from the construction site and staging areas, where possible. Through the implementation of best management practices associated with general construction and adherence to pertinent downtown design guidelines (such as the Historic Downtown Los Angeles Guidelines and Downtown Design Guide and other applicable regulations, including but not limited to, the LAMC, LADOT Traffic Control Handbook and Traffic Manual and CBC) to ensure the proposed project elements would conform to their unique visual environments, adverse construction-period effects...
on visual resources would be avoided or substantially minimized. Moreover, since temporary changes to views as a result of construction-period activities are not considered adverse, effects on visual resources as a result of construction would also be not adverse.

**Effect CON-15: Water Quality and Hydrology**

**Not Adverse.** Construction activities would temporarily denude areas that are currently paved resulting in erosion and effecting water quality. Erosion may occur, particularly on the steeper grades along 1st Street. Projects involving grading of an area greater than one acre are required to apply for a National Pollutant Discharge Elimination System (NPDES) permit from the Los Angeles Regional Water Quality Control Board. This permit requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that incorporates best management practices (BMPs) for erosion control. Specifically, construction activity resulting in a land disturbance of one acre or more, or less than one acre but part of a larger common plan of development or sale must obtain the Construction Activities Stormwater General Permit. Construction activity includes clearing, grading, excavation, stockpiling, and reconstruction of existing facilities involving removal and replacement. Implementation of BMPs would ensure that sediment would be confined to the construction area and not transported off site. Therefore, the Project would not result in an adverse effect related to water and hydrology.

**4.14.2.1 Grand Avenue Extension Design Option**

Implementation of the Grand Avenue Extension Design Option would require similar construction activities as discussed above for the Project. The analyses described above for the Project also apply to the Grand Avenue Extension Design Option. There would be no additional adverse effects related to Air Quality, Cultural Resources, Transportation and Traffic, or any other resource area. In addition, Mitigation Measures NV-C1 through NV-C16 would minimize potential adverse noise and vibration levels, including those that may affect the Disney Concert Hall. Specifically, Mitigation Measure NC-C14 requires vibration monitoring at the Disney Concert Hall. Therefore, implementation of the Grand Avenue Extension Design Option would not result in an adverse effect related to construction.

**4.15.3 Measures to Minimize Harm**

**Air Quality**

**AQ-C1: Use cleaner-burning off-road construction equipment per the following schedule:**

The contractor shall ensure that all off-road diesel-powered construction equipment greater than 50 horsepower (hp) shall meet the Tier 4 emission standards. In addition, all construction equipment shall be outfitted with best available control technology (BACT) devices certified by ARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by ARB regulations. The City of Los Angeles Department of Public Works, Bureau of Engineering, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the Department of Public Works Contracts Administration Bureau Construction Inspector.
Biological Resources

**BIO-C1: Tree Removal/Relocation.** Should mature trees, as well as younger trees (with trunk diameters of 5 inches at breast height or less) be trimmed or removed, the proposed Project would comply with the *City of Los Angeles Tree Preservation Ordinance* and *Tree Preservation Policy*. City policy requires all tree removals be replaced on a 2:1 basis for street trees and 4:1 basis for protected private property trees. No protected trees were identified throughout the proposed alignment and at the potential MSF siting locations. Replacement trees would be placed as near their original locations as possible. Alternative methods and options to removal, such as trimming, would be explored prior to considering potential tree removal. The Project's compliance with the *City of Los Angeles Tree Preservation Ordinance* and *Tree Preservation Policy* would ensure that any street trees slated for removal would be planted at or near their original locations at 2:1 ratios. Removal or relocation of protected trees, under the City's *Tree Preservation Ordinance*, requires a permit from the Board of Public Works. A protected tree report must be submitted to the Board of Public Works to apply for a tree removal permit. Before a Special Habitat Value tree, as defined by the City's *Tree Preservation Policy*, is pruned, damaged, relocated, or removed, recommendations from the Department of Public Works, Bureau of Street Services, Urban Forestry Division must be obtained. The Urban Forestry Division makes a recommendation to the Board of Public Works for removal. The Board of Public Works must make the final approval before the trees(s) can be removed.

Cultural Resources

**CUL-C1:** As part of final design, a detailed field survey shall be conducted to identify historic sidewalk features that need to be avoided, protected during construction, or altered in conformance with the Secretary's Standards. Conditions to protect the historic sidewalk features and preserve the material in place during construction will be required. Historic sidewalk features should be covered with a protective material to avoid scratches and staining from adjacent construction work. OCS poles will not be installed in terrazzo installations or vault lights. Sidewalk ramps will be designed or located to avoid physical damage or alteration of historic sidewalk features. The existing concrete curb will not be removed at bump out areas in order to protect the historic sidewalk feature from being saw cut or from cracking. Design drawings will be made available to contractors during construction, which will identify historic sidewalk features. These measures will reduce the potential to alter or cause physical damage to historic sidewalk features, and therefore avoid, minimize, or mitigate adverse changes to the historic district, individually significant resources or features that contribute to designated resources. Should incidental damage occur during construction, the historic sidewalk feature it would be repaired or replaced in kind by a qualified contractor in a manner consistent with the Secretary's Standards. In the unlikely event that a damaged sidewalk feature could not be treated in accordance with the Secretary's Standards, compliance with the Secretary's Standards to the maximum extent feasible would be undertaken. Even in such an event, there would still be no adverse impact on any historic buildings, districts, or any other designated historic resources because enough contributing features would remain so that the historical resource at issue would remain eligible as a historic resource. If any historic features cannot be restored in conformity with the Secretary’s Standards, the Contractor shall immediately cease action and contact the Engineer, as well as FTA, who will in turn consult directly with SHPO to determine appropriate next steps.
CUL-C2: If discovery is made of items of archaeological or paleontological interest, the Contractor shall immediately cease excavation in the area of discovery and notify the Engineer and FTA. Work shall not continue until ordered by the Engineer. When resumed, excavation operations within the area of discovery shall be as directed by the Engineer. Discoveries which may be encountered may include, but not be limited to, dwelling sites, stone implements or other artifacts, animal bones, human bones, and fossils. Discoveries without prior planning would follow the federal process and requirements set forth in the Section 106 regulations at 36 CFR § 800.13 (b).

Geology, Soils, and Seismicity

GEO-C1: In order to ensure that utility relocation, track-laying activities, and MSF construction do not result in a substantially increased risk of soil instability, temporary shoring shall be used for lateral support, and properly compacted fill soils or cement slurry shall be used for excavation backfill. A geotechnical report shall be prepared during the design phase, subject to approval by the City, that will address the following topics, and will also recommend specific design specifications, which may include, but are not limited to:

- **Liquefaction and Lateral Spreading:** Methods for construction in areas with a potential liquefaction hazard may include in situ ground modification, removal of liquefiable layers and replacement with compacted fill, or support of project improvements on piles at depths designed specifically for liquefaction. Pile foundations can be designed for a liquefaction hazard by supporting the piles on dense soil or bedrock located below the liquefiable zone or employing other appropriate methods, as evaluated during the site-specific evaluation. Additional recommendations for mitigation pertaining to liquefaction may include densification by installation of stone columns, vibration, deep dynamic compaction, and/or compaction grouting.

- **Structural Support:** Recommendations will be made related to the methods of construction of the MSF in proximity to existing buildings, such as buffer distances to maintain from existing buildings or structural supports for these buildings during the construction period.

The construction contractor shall implement all recommendations from this report into the work plan. The City of Los Angeles Department of Public Works, Bureau of Engineering, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the Department of Public Works Contracts Administration Bureau Construction Inspector.

Hazardous Materials

HM-C1: During construction, a focused PSI shall be conducted at specified locations adjacent to the identified sites of concern with moderate, high, and indeterminate risks as well as the proposed locations for the MSF and TPSSs. A PSI in these areas shall include a soil boring and laboratory analytical program to address contaminants of concern specific to each site. Soils that have visible staining or an odor shall first be tested in the field by the contractor or qualified environmental subcontractor with an organic vapor analyzer (OVA) or other field equipment for volatile components, which require additional considerations in their handling. Soil with OVA readings exceeding 50 ppm for VOCs (probe held 3 inches from the excavated soil face), or that is visibly stained or has a detectable petrochemical odor, shall be stockpiled by the contractor separately from non-contaminated soils. The stockpiles shall be barricaded near the excavation.
area, away from drainage areas or catch basins, on an impermeable plastic liner (6-millimeter
nominal thickness and tested at 100 pounds per square inch). Caution must be taken to separate
any contaminated soil from the remainder of the excavated material. If only a small amount of
contaminated soil is encountered, it may be drummed in 55-gallon steel drums with sealing lids.
The DPW Bureau of Engineering (BOE), through the construction contractor per bid
specifications, shall be the responsible party. Enforcement shall be achieved through the DPW
Contracts Administration Bureau Construction Inspector.

**HM-C2:** Soil shall be sampled in a random and representative manner. To establish waste
classification, samples shall be analyzed for total recoverable petroleum hydrocarbons (TRPH),
VOCs, and total petroleum hydrocarbons (TPH) as gasoline or diesel if these fuels are found in
the area, Title 22 heavy metals, reactivity (pH), corrosivity, and toxicity. The number of samples
shall depend on the volume of material removed, with one sample for approximately every ton
of soil. Storage space available at the site and neighborhood sensitivity shall determine the
amount of soil that can be stockpiled. The DPW BOE, through the construction contractor per
bid specifications, shall be the responsible party. Enforcement shall be achieved through the
DPW Contracts Administration Bureau Construction Inspector.

**HM-C3:** If VOCs are present at concentrations exceeding 50 ppm, a permit from the South Coast
Air Quality Management District shall be required, which most likely shall require control of
vapor, such as covering the stockpiles with plastic sheeting or wetting with water or a soap
solution. The contractor shall obtain all necessary permits. The DPW BOE, through the
construction contractor per bid specifications, shall be the responsible party. Enforcement shall
be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**HM-C4:** During construction, suspected contaminated soil samples shall be taken to a state-
certified environmental laboratory or tested in the field with a mobile lab and technician using
infrared spectrometry in accordance with appropriate testing methods. Materials with elevated
levels of TRPH, metals, or other regulated contaminants shall require handling by workers who
have been adequately trained for health and safety aspects of hazardous material handling. The
DPW BOE, through the construction contractor per bid specifications, shall be the responsible
party. Enforcement shall be achieved through the DPW Contracts Administration Bureau
Construction Inspector.

**HM-C5:** Any contaminated material (soil, asphalt, railroad ballast, concrete, or debris) that is to
be hauled off-site and is considered a “waste product” shall be classified as hazardous or
nonhazardous waste under all criteria by both state and federal codes prior to disposal. If the
waste soil or other material is determined hazardous, a hazardous waste manifest shall be
prepared by the contractor or its qualified representative and the material transported to an
appropriate class of facility for recycling or landfill disposal by a registered hazardous material
transporter. If the soil is nonhazardous but still exceeds levels that preclude its return to the
excavation, a less-costly nonhazardous transporter and soil recycling facility shall be used if no
hazardous constituents are present above their respective action levels. The DPW BOE, through
the construction contractor per bid specifications, shall be the responsible party. Enforcement
shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**HM-C6:** At the start of construction, all construction contractors shall be instructed to
immediately stop all subsurface activities in the event that potentially hazardous materials are
encountered, an odor is identified, or significantly stained soil is visible. Contractors shall be
instructed to follow all applicable regulations regarding discovery and response for hazardous
materials encountered during the construction process. Furthermore, hazardous waste generated by the contractor at the site shall be disposed of in accordance with the City’s Notification of Hazardous Substances General Conditions in the construction contract. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**HM-C7:** In the event groundwater is encountered during construction, dewatering shall be minimized to that required for removing interior or nuisance water from structures. Sampling ports shall be provided in the dewatering system. The produced water shall be required to be temporarily stored in large Baker-type tanks and analyzed by a state-certified environmental laboratory selected by the contractor. If the groundwater quality falls within guidelines established by the DPW, Bureau of Sanitation, a permit shall be obtained to discharge the water into a nearby sewer. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**HM-C8:** During construction, if hydrocarbon or other water contamination precludes the measures in HM-C7, the contaminated groundwater shall be treated on site (such as in an oil-water separator) or hauled off site for treatment and disposal in accordance with applicable regulations by a licensed professional. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**Land Acquisition, Displacement, and Fiscal Impacts**

**ECON-C1: Business Access and Signage.** The construction contractor shall provide signs for businesses whose frontage is obstructed by construction work indicating that the business is open during construction, and provide information regarding access to the business.

**Noise and Vibration**

**NV-C1:** The contractor shall limit nighttime construction activities (during the hours from 10:00 p.m. to 7:00 a.m.) to generate lower noise levels, which may include, but not be limited to, concrete pouring, field welding, and underground utility work. The City of Los Angeles Department of Public Works (DPW), Bureau of Engineering (BOE), through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-C2:** The contractor shall use specialty equipment with enclosed engines and/or high-performance mufflers. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-C3:** The contractor shall locate equipment and staging areas as far from noise-sensitive receivers as practicable. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.
NV-C4: The contractor shall limit unnecessary idling of equipment. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C5: The contractor shall install temporary noise barriers to enclose stationary noise sources, such as compressors, generators, laydown and staging areas, and other noisy equipment. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C6: The contractor shall reroute construction-related truck traffic away from residential buildings to the extent practicable. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C7: The contractor shall sequence the use of equipment so that simultaneous use of the loudest pieces of equipment is avoided as much as practicable. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C8: The contractor shall avoid the use of impact equipment and, where practicable, use non-impact equipment. Non-impact equipment could include electric or hydraulic-powered equipment rather than diesel and gasoline-powered equipment where feasible. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C9: The contractor shall use portable noise control enclosures for welding in the construction staging area. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C10: If a noise variance from Section 41.40(a) of the Los Angeles Municipal Code is sought, a noise limit shall be specified. The contractor shall employ a combination of the above-listed noise-reducing approaches to meet the noise limit. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C11: Specific measures to be employed to mitigate construction noise impacts shall be developed by the contractor and presented in the form of a Noise Control Plan. The Noise Control Plan shall be submitted for review and approval before the beginning of construction activities. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

NV-C12: A preconstruction survey shall be conducted, including an inspection of building foundations and photographs of pre-existing conditions. The survey can be limited to (a) the first row of buildings along the selected alignment and will include the locations of the glass blocks and associated subterranean vaults and (b) buildings within approximately 200 feet of the construction zone that are deemed to be extremely susceptible to vibration, as determined by local authorities. These will be included in the survey. The DPW BOE, through the
construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-C13:** Per the *FTA Guidance Manual*, construction vibration shall be limited to the PPV, ranging from 0.12 inch per second for “buildings identifiable as being extremely susceptible to vibration damage” to 0.5 inch per second for “reinforced concrete, steel, or timber” buildings. The contract specifications shall establish appropriate damage risk vibration limits for historic properties within 200 feet of construction. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-C14:** The contractor shall be required to monitor vibration at any building where the lower vibration limit is applicable and at any location where complaints about vibration are received from building occupants. This shall include “special” land uses, such as the Disney Concert Hall and the Colburn School. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-C15:** If the contractor’s plan calls for high-vibration construction activities being performed close to structures, the contractor may be required to use alternative procedures that produce lower vibration levels. Examples of high-vibration construction activities include the use of pavement breakers, vibratory compaction, and hoe rams next to sensitive buildings. Alternative procedures shall include the use of non-vibratory compaction in limited areas and concrete saws in place of jackhammers or pavement breakers for demolition. To avoid potential interference with “special” land uses caused by construction vibration, the contractor shall be required to coordinate with building owners to limit high-vibration construction activities to times when sensitive activities are not occurring inside the buildings. For example, the contractor could avoid the use of high-vibration construction equipment during a scheduled performance or recording at the Disney Concert Hall. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

**NV-C16:** The Contractor shall hire a Noise and Vibration Mitigation Coordinator to provide notice to venues and sound-sensitive land uses along the corridor at least two weeks in advance of construction activities. The role of the Mitigation Coordinator (N&VMC) will be to respond to concerns related to implementation of construction-related mitigation measures. The DPW BOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contracts Administration Bureau Construction Inspector.

### Transportation and Traffic

**TRAF-C1:** Develop a Construction Traffic Management Plan. The Los Angeles Department of Transportation (LADOT) shall develop and implement a Traffic Management Plan (TMP) to reduce construction-related traffic impacts on public services, community facilities, utilities, bicycle circulation, and pedestrian circulation. The TMP shall be prepared during final design for implementation during construction to mitigate the traffic impacts caused by construction of the Project. The TMP shall identify potential measures such as public awareness and changeable message signs. The TMP shall be developed in consultation with emergency service providers (i.e., local police and fire departments).
The TMP shall address construction duration and activities and include measures such as a temporary traffic signal, bicycle lane detours, or flagmen adjacent to construction activities. The TMP shall also coordinate review of construction activities along cross and parallel streets accordingly. A community affairs entity shall be established to administer a construction impact mitigation program for the benefit of the community. This program shall keep the community informed of all construction activities, with special emphasis on activities that affect the public. The program shall also set up a hotline number with a direct connection to staff familiar with the community and the Project. This entity shall offer individual consultation for residents, facilities, and businesses for remedies appropriate to the impacts encountered. The program shall identify community/business needs prior to and during the construction period through the use of surveys and community meetings. LADOT and the City of Los Angeles Department of Public Works, Bureau of Engineering (LABOE), through the construction contractor per bid specifications, shall be the responsible party. Access to businesses will be maintained during construction. Enforcement shall be achieved through the City of Los Angeles Department of Public Works Contracts Administration Bureau Construction Inspector.

TRAF-C2: Construction Mitigation Monitoring. A construction mitigation program shall be established with participation of City of Los Angeles Department of Public Works, Bureau of Engineering (LABOE), Bureau of Contracts Administration, and the construction contractor. All mitigation measures shall be monitored and reported to LABOE on a quarterly basis. The Los Angeles Department of Transportation and LABOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the City of Los Angeles Department of Public Works Contracts Administration Bureau Construction Inspector.

Visual Quality

AES-C1: Construction Staging/Stockpiled Materials and Equipment. Under the direction of the LABOE, the construction contractor shall be the responsible party for providing temporary construction fencing along the periphery of active construction areas to screen as much of the construction activity as possible from view at the street level.

To minimize views of stockpiled materials and idled construction equipment in staging areas and to reduce visual clutter and disorder, consistent with Bureau of Engineering Master Specification Environmental Control Measures, project construction staging areas shall be enclosed or screened from view at the street level with appropriate screening materials. The contractor shall provide daily visual inspections to ensure that the immediate surroundings of construction staging areas are free from construction-related clutter and graffiti and maintain the areas in a clean and orderly manner throughout the construction period. Graffiti shall be promptly painted over, masked out, or cleaned off. Routine sidewalk and window washing to remove dust generated by construction shall be scheduled weekly. LABOE, through the construction contractor per bid specifications, shall be the responsible party. Enforcement shall be achieved through the DPW Contract Administration Bureau Construction Inspector.

AES-C2: Nighttime Construction Activities. Should construction activities with associated lighting occur during nighttime, the City shall ensure that lighting will be directed away from surrounding sensitive land uses and toward the specific location intended for illumination. Lighting associated with construction activities and security purposes shall be shielded to minimize the production of glare and spill light around sensitive land uses in the surrounding
City of Los Angeles Department of Public Works, Bureau of Engineering
Chapter 4.0
Affected Environment/Environmental Consequences

4.16 Indirect and Cumulative Effects

NEPA requires that any agency proposing a major federal action, which may adversely affect the environment, consider the environmental impacts of the proposed action, any unavoidable adverse environmental impacts, and the relationship between local short term uses and long term productivity of the environment (42 U.S.C. 4332(c)). There are three types or categories of effect that must be considered during the NEPA process: direct, indirect, and cumulative (40 CFR 1508.25). A direct effect is one which is caused directly by our activities, at the same time, and in the same place. An indirect effect is a reasonably foreseeable effect caused by the proposed action or alternatives, but occurs later in time or are further removed from the project site than a direct effect. “Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate,” and related effects on resources (40 CFR 1508.8(b)). A cumulative effect is an “impact on the environment which results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions” (40 CFR 1508.7). Cumulative effects can result from individually minor but collectively significant actions taking place over time (40 CFR 1508.7). The following discussions relate to the Project without and with the Grand Avenue Extension Design Option.

Effect CUM-1: Indirect Effects

Not Adverse. An indirect effects analysis is required when a project has the potential to cause induced changes to resources or growth inducing impacts – most transportation projects have the potential to cause such an impact due to changes in land use, population density and economic development.

Growth-inducing impacts are those effects of a project that might foster economic or population growth or the construction of new housing, either directly or indirectly, in the surrounding environment. Increases in the population may burden existing community service facilities, requiring construction of new facilities that could cause significant environmental effects.

Induced growth is defined as any growth that exceeds planned growth and results from new development that would not have otherwise taken place without implementation of a project. The growth-inducing potential of a project would be considered adverse if it results in growth or population concentration that exceeds the assumed levels included in applicable master plans, land use plans, or projections made by regional planning authorities. Any potential environmental impacts of induced growth would be secondary or indirect effects of the Project. Secondary effects of induced growth due to the Project could include impacts such as increased demand on community or public services, increased traffic and noise, or degradation of air and water quality.

The Project would not include any housing or require a large number of employees and, therefore, it would not directly increase population or generate a substantial amount of long-term employment, nor would implementation of the Project change patterns of land use or development. However, the Project could contribute to growth in downtown Los Angeles; as an expressed objective, the Project is intended to support growth in downtown Los Angeles by revitalizing areas and providing an amenity that would attract new residents and visitors to downtown. Accordingly, by providing
investment in an area that has been targeted for revitalization, the Project could indirectly contribute to growth through the provision of new infrastructure and a population-attracting amenity that would bring new development.

Given the planned related projects in the study area, growth is reasonably foreseeable. There would be some physical changes associated with the MSF and TPSS sites, but implementation of the Project would affect primarily the transportation rights-of-way. Physical changes within the rights-of-way would not make adjacent properties easier to develop. Table 4.16-1 lists projects that were considered in the cumulative impact analysis, which was obtained from the EIR. The locations of these projects are depicted on Figure 4.16-1.

Downtown Los Angeles is the urbanized core of the City and has been designated for employment, housing, civic institutions, and entertainment venues by the City’s General Plan and Zoning Code. The 2013–2021 Housing Element of the City of Los Angeles General Plan, adopted in December 2013, identified 443 sites in the Central City Community Plan Area that are capable of supporting just under 18,000 housing units within the study area (City of Los Angeles 2013c). Any employment growth occurring as a direct or indirect effect of the Project is expected to be absorbed by the commercial and office property markets. In addition, if vacancy rates were to decline, new construction through redevelopment could also accommodate this growth.

The Project would be consistent with projected growth and would support general plan objectives and policies with respect to projected growth by:

- Providing for future expansion and improvement based on travel demand (Framework Element, Land Use Objective 3.3).
- Recognizing all modes of travel, including pedestrian, bicycle, transit, and vehicular modes—including goods movement—as integral components of the City's transportation system (Mobility Element, Policy 3.1).
- Providing all residents, workers, and visitors with affordable, efficient, convenient, and attractive transit services (Mobility Element, Policy 3.4).
- Supporting “first-mile, last-mile solutions” such as multi-modal transportation services, organizations, and activities in the areas around transit stations and major bus stops (transit stops) to maximize multi-modal connectivity and access for transit riders (Mobility Element, Policy 3.5).
- Expanding transportation services to enhance neighborhood accessibility and accommodate growth (Framework Element, Land Use Objective 3.11).

The Project would provide a transit amenity that emphasizes short-distance daily trips, which would be an amenity serving reasonably foreseeable growth within downtown Los Angeles. The Project could contribute to residential and commercial development in the area, but the amount of potential growth attributable to the Project would be too speculative to determine. If there is uncertainty about future land use, the lead agency is not required to engage in speculation but should make a judgment based on reasonably foreseeable occurrences (CEQ 40 Questions, No. 18).

In addition, the new transit line would cause an increase in transit ridership and an associated decrease in automobile usage (thereby reducing fuel consumption and causing an indirect but positive impact on criteria pollutants, GHG emissions, and energy consumption). Therefore, the Project would not result in adverse indirect effects.
### Table 4.16-1. Related Projects

<table>
<thead>
<tr>
<th>Map No. (Figure 4.16-1)</th>
<th>Project Name</th>
<th>Location</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ava Little Tokyo (2005-Cen-1993)</td>
<td>200 Los Angeles St.</td>
<td>Condominiums Apartments Retail</td>
<td>570 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>280 units</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50,000 sf</td>
</tr>
<tr>
<td>2</td>
<td>TenTen Wilshire Expansion (The Icon)</td>
<td>1027 W. Wilshire Blvd</td>
<td>Condominiums Retail</td>
<td>402 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7,428 sf</td>
</tr>
<tr>
<td>3</td>
<td>Vibiana Lofts</td>
<td>225 S. Los Angeles St.</td>
<td>Condominiums Retail</td>
<td>300 units</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,400 sf</td>
</tr>
<tr>
<td>4</td>
<td>Northeast Tower</td>
<td>215 W. 9th St.</td>
<td>Condominiums Retail</td>
<td>210 units</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9,000 sf</td>
</tr>
<tr>
<td>5</td>
<td>Amacon Project</td>
<td>1133 S. Hope St.</td>
<td>Condominiums Restaurant</td>
<td>159 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6,827 sf</td>
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<tr>
<td>6</td>
<td>Mixed-Use Redevelopment Project</td>
<td>745 S. Spring St.</td>
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<td></td>
<td></td>
<td></td>
<td>10,675 sf</td>
</tr>
<tr>
<td>7</td>
<td>5th &amp; Olive</td>
<td>427 W. 5th St.</td>
<td>Apartments Restaurant</td>
<td>615 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16,309 sf</td>
</tr>
<tr>
<td>8</td>
<td>11th &amp; Hill Project</td>
<td>1115 S. Hill St.</td>
<td>Condominiums Restaurant</td>
<td>172 units</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6,850 sf</td>
</tr>
<tr>
<td>9</td>
<td>Bixel &amp; Lucas</td>
<td>1102 W. 6th St.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,996 sf</td>
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<tr>
<td>10</td>
<td>8th/Hope/Grand Project</td>
<td>609 W. 8th St.</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>200 units</td>
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<td></td>
<td>32,000 sf</td>
</tr>
<tr>
<td>11</td>
<td>Office Building</td>
<td>1130 W. Wilshire Blvd.</td>
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<td>n/a</td>
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<tr>
<td>12</td>
<td>6th &amp; Main Residential Project</td>
<td>601 S. Main St.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>13</td>
<td>Mixed-Use Project (Herald Examiner)</td>
<td>1111 S. Broadway</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>39,725 sf</td>
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<td></td>
<td></td>
<td></td>
<td>49,000 sf</td>
</tr>
<tr>
<td>14</td>
<td>Mixed-Use</td>
<td>1148 S. Broadway</td>
<td>Apartments Retail</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>2,500 sf</td>
</tr>
<tr>
<td>15</td>
<td>DTLA South Park Site 1</td>
<td>1120 S. Grand Ave.</td>
<td>Apartments Hotel Retail</td>
<td>461 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>300 room</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8,700 sf</td>
</tr>
<tr>
<td>16</td>
<td>Variety Arts (Mixed-Use)</td>
<td>940 S. Figueroa St.</td>
<td>Office Restaurant Bar</td>
<td>3,295 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10,056 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5,119 sf</td>
</tr>
<tr>
<td>Map No. (Figure 4.16-1)</td>
<td>Project Name</td>
<td>Location</td>
<td>Description</td>
<td>Size</td>
</tr>
<tr>
<td>--------------------------</td>
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</tr>
<tr>
<td>17</td>
<td>Restaurant</td>
<td>1036 S. Grand Ave.</td>
<td>Restaurant</td>
<td>7,149 sf</td>
</tr>
<tr>
<td>18</td>
<td>Residential</td>
<td>459 S. Hartford Ave.</td>
<td>Apartments</td>
<td>49 units</td>
</tr>
<tr>
<td>19</td>
<td>Mixed-Use</td>
<td>1150 W. Wilshire Blvd</td>
<td>Apartments Restaurant</td>
<td>80 units 4,589 sf</td>
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<tr>
<td>20</td>
<td>Mixed-Use</td>
<td>737 S. Spring St.</td>
<td>Apartments Pharmacy</td>
<td>320 units 25,000 sf</td>
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<tr>
<td>21</td>
<td>Apartments</td>
<td>1218 W. Ingraham St.</td>
<td>Apartments</td>
<td>90 units</td>
</tr>
<tr>
<td>22</td>
<td>Condominiums</td>
<td>742 S. Hartford Ave.</td>
<td>Condominiums</td>
<td>58 units</td>
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<tr>
<td>23</td>
<td>Mixed-Use</td>
<td>732 S. Spring St.</td>
<td>Apartments Pharmacy/Drug Store</td>
<td>400 units 15,000 sf</td>
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<tr>
<td>24</td>
<td>Mixed-Use</td>
<td>340 S. Hill St.</td>
<td>Apartments Retail</td>
<td>428 units 6,700 sf</td>
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<tr>
<td>25</td>
<td>Glass Tower Project (Mixed Use)</td>
<td>1050 S. Grand Ave.</td>
<td>Condominiums Retail Restaurant</td>
<td>151 units 3,472 sf 2,200 sf</td>
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<td>26</td>
<td>Embassy Tower</td>
<td>848 S. Grand Ave.</td>
<td>Condominiums Restaurant</td>
<td>420 units 38,500 sf</td>
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<tr>
<td>27</td>
<td>Zen Mixed-Use Project (Kawada Tower)</td>
<td>250 S. Hill St.</td>
<td>Condominiums Retail</td>
<td>330 units 12,000 sf</td>
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<tr>
<td>28</td>
<td>Apartments</td>
<td>1027 S. Olive St.</td>
<td>Apartments</td>
<td>100 units</td>
</tr>
<tr>
<td>29</td>
<td>Mixed-Use</td>
<td>928 S. Broadway</td>
<td>Apartments Retail Live/Work Office Restaurant</td>
<td>662 units 47,700 sf 11,000 sf 34,824 sf</td>
</tr>
<tr>
<td>30</td>
<td>Mixed Use</td>
<td>534 S. Main St.</td>
<td>Apartments Retail Restaurant</td>
<td>160 units 18,000 sf 7,000 sf</td>
</tr>
<tr>
<td>31</td>
<td>Mixed Use</td>
<td>840 S. Olive St.</td>
<td>Condominiums Restaurant Retail</td>
<td>303 units 9680 sf 1500 sf</td>
</tr>
<tr>
<td>32</td>
<td>Mixed Use</td>
<td>710 S. Grand Ave.</td>
<td>Apartments Retail Restaurant</td>
<td>700 units 27,700 sf 5,000 sf</td>
</tr>
<tr>
<td>33</td>
<td>ISAF – Retail/Restaurant</td>
<td>201 S. Broadway</td>
<td>Retail/Restaurant</td>
<td>27,765 sf</td>
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<tr>
<td>34</td>
<td>Mixed-Use</td>
<td>400 S. Broadway</td>
<td>Apartments Retail Bar</td>
<td>430 units 10,000 sf 5,000 sf</td>
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<tr>
<td>35</td>
<td>1001 S. Olive St. Project</td>
<td>1001 S. Olive St.</td>
<td>Apartments Restaurant</td>
<td>225 units 5,000 sf</td>
</tr>
<tr>
<td>36</td>
<td>Mixed-Use</td>
<td>1000 S. Grand</td>
<td>Apartments Restaurant</td>
<td>274 units 12,000 sf</td>
</tr>
<tr>
<td>Map No. (Figure 4.16-1)</td>
<td>Project Name</td>
<td>Location</td>
<td>Description</td>
<td>Size</td>
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<tr>
<td>-------------------------</td>
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</tr>
<tr>
<td>37</td>
<td>Hill St. Mixed-Use</td>
<td>920 S. Hill St.</td>
<td>Apartments Retail</td>
<td>239 units</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5,400 sf</td>
</tr>
<tr>
<td>38</td>
<td>Broadway Mixed-Use</td>
<td>955 S. Broadway</td>
<td>Residential Retail</td>
<td>169-218 units</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>7,000 sf</td>
</tr>
<tr>
<td>39</td>
<td>Mixed-Use</td>
<td>801 S. Olive St.</td>
<td>Apartments Restaurant</td>
<td>331 units</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>10,000 sf</td>
</tr>
<tr>
<td>40</td>
<td>Olympic &amp; Olive Mixed-Use Project</td>
<td>960 S. Olive St.</td>
<td>Apartments Restaurant</td>
<td>263 units</td>
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<td></td>
<td></td>
<td></td>
<td>14,500 sf</td>
</tr>
<tr>
<td>41</td>
<td>Mixed-Use</td>
<td>820 S. Olive St.</td>
<td>Apartments Retail</td>
<td>589 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,500 sf</td>
</tr>
<tr>
<td>42</td>
<td>Wilshire Grand Project</td>
<td>900 W. Wilshire Blvd.</td>
<td>Hotel Office Restaurant/Retail</td>
<td>900 units</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>45,100 sf</td>
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<tr>
<td>43</td>
<td>Grand Ave. (Parcel M-2 Rev)</td>
<td>237 S. Grand Ave.</td>
<td>Apartments Museum Restaurant</td>
<td>265 units</td>
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<td>120,000 sf</td>
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<td>5,200 sf</td>
</tr>
<tr>
<td>44</td>
<td>Metropolis Mixed Use</td>
<td>851 S. Francisco St.</td>
<td>Condominiums Hotel Office Retail</td>
<td>836 units</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>480 units</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>988,225 sf</td>
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<td></td>
<td></td>
<td></td>
<td>46,000 sf</td>
</tr>
<tr>
<td>45</td>
<td>Olympic and Hill Mixed-Use Project</td>
<td>301 W. Olympic Blvd.</td>
<td>Apartments Retail Restaurant</td>
<td>300 units</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>14,500 sf</td>
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<td>8,500 sf</td>
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<td>46</td>
<td>Mixed-Use</td>
<td>1145 W. 7th St.</td>
<td>Condos Apartments Retail</td>
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<td></td>
<td>7,200 sf</td>
</tr>
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<td>47</td>
<td>Sapphire Mixed-Use</td>
<td>1111 W. 6th St.</td>
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<td>362 units</td>
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<td>18,959 sf</td>
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<td></td>
<td></td>
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<td>3,504 sf</td>
</tr>
<tr>
<td>48</td>
<td>940 S. Hill MU</td>
<td>940 S. Hill St.</td>
<td>Apartments Retail</td>
<td>240 units</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>14,000 sf</td>
</tr>
<tr>
<td>49</td>
<td>Clinic at 7th &amp; Wall</td>
<td>649 S. Wall St.</td>
<td>Assisted Living Beds Medical Office w/employees</td>
<td>55 beds</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>55 employees</td>
</tr>
<tr>
<td>50</td>
<td>Medallion Phase 2</td>
<td>300 S. Main St.</td>
<td>Residential Retail Restaurant</td>
<td>471 units</td>
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<td>51</td>
<td>Alexan South Broadway</td>
<td>850 S. Hill St.</td>
<td>Apartments Retail Restaurant</td>
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<td>3,500 sf</td>
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<tr>
<td>Map No. (Figure 4.16-1)</td>
<td>Project Name</td>
<td>Location</td>
<td>Description</td>
<td>Size</td>
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<tr>
<td>-------------------------</td>
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</tr>
<tr>
<td>52</td>
<td>Hall of Justice Reuse Project</td>
<td>211 W. Temple St.</td>
<td>Other</td>
<td>456,900 sf</td>
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<td>53</td>
<td>FIDM 2006 Campus Expansion</td>
<td>939 S. Flower St.</td>
<td>School Campus</td>
<td>95,700 sf</td>
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<tr>
<td>54</td>
<td>Da Vinci (Mixed Use)</td>
<td>327 N. Fremont Ave.</td>
<td>Apartments Retail</td>
<td>600 units</td>
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<tr>
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<td></td>
<td></td>
<td>Retail</td>
<td>30,000 sf</td>
</tr>
<tr>
<td>55</td>
<td>Park Fifth Project (formerly)</td>
<td>450 S. Olive St.</td>
<td>Condominiums Retail</td>
<td>900 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurant</td>
<td>19,000 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>19,200 sf</td>
</tr>
<tr>
<td>56</td>
<td>Condominium Project</td>
<td>810 E. Pico Blvd.</td>
<td>Condominiums</td>
<td>131 units</td>
</tr>
<tr>
<td>57</td>
<td>9th/Olive Mixed Use</td>
<td>860 S. Olive St.</td>
<td>Condominiums Retail</td>
<td>255 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurant</td>
<td>18,900 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6,000 sf</td>
</tr>
<tr>
<td>58</td>
<td>Condominiums</td>
<td>1340 S. Olive St.</td>
<td>Condominiums</td>
<td>150 units</td>
</tr>
<tr>
<td>59</td>
<td>Manufacturing</td>
<td>800 E. 12th St.</td>
<td>Manufacturing</td>
<td>320,497 sf</td>
</tr>
<tr>
<td>60</td>
<td>Avant (Mixed-Use Project)</td>
<td>1340 S. Figueroa St.</td>
<td>Condominiums Retail</td>
<td>273 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurant</td>
<td>11,000 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Spa</td>
<td>9,000 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10,000 sf</td>
</tr>
<tr>
<td>61</td>
<td>LAUSD 9th St. Span K-8 Redevelopment Project</td>
<td>820 S. Towne Ave.</td>
<td>Elementary enrollment</td>
<td>100 seats</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Middle school enrollment</td>
<td>405 seats</td>
</tr>
<tr>
<td>62</td>
<td>Convention Center Modernization &amp; Farmers Field Project</td>
<td>1110 W. 11th St.</td>
<td>Stadium Meeting Room</td>
<td>76,250 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rentable Event Center</td>
<td>143,500 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Meeting Room</td>
<td>102,150 sf</td>
</tr>
<tr>
<td>63</td>
<td>Bowling Alley</td>
<td>333 S. Alameda St.</td>
<td>Bowling Alley</td>
<td>40,800 sf</td>
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<tr>
<td>64</td>
<td>1500 S. Figueroa Mixed Use</td>
<td>1500 S. Figueroa St.</td>
<td>Apartments Retail</td>
<td>190 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurant</td>
<td>10,922 sf</td>
</tr>
<tr>
<td>65</td>
<td>LA Civic Center Office</td>
<td>150 N Los Angeles St.</td>
<td>Retail Office</td>
<td>35,000 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Child Care</td>
<td>712,000 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,500 sf</td>
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<tr>
<td>66</td>
<td>Onyx (SPR Mixed Use)</td>
<td>1306 S. Hope St.</td>
<td>Apartments Retail</td>
<td>419 units</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Retail</td>
<td>42,200 sf</td>
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<tr>
<td>67</td>
<td>Mixed-Use Project</td>
<td>1150 S. Grand Ave.</td>
<td>Condominiums Retail</td>
<td>351 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurant</td>
<td>12,500 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12,500 sf</td>
</tr>
<tr>
<td>68</td>
<td>G12 Mixed Use</td>
<td>1200 S. Grand Ave.</td>
<td>Apartments Retail</td>
<td>640 units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurant</td>
<td>45,000 sf</td>
</tr>
<tr>
<td>69</td>
<td>Omni Group Tower</td>
<td>888 S. Olive St.</td>
<td>Apartment</td>
<td>283 units</td>
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<tr>
<td>70</td>
<td>Regional Connector</td>
<td>1st St. and Central Ave. to 7th St. and Flower St.</td>
<td>Light Rail</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Broadway Streetscape Master Plan</td>
<td>Broadway and 2nd St. to Broadway and Olympic Blvd.</td>
<td>Streetscape</td>
<td></td>
</tr>
<tr>
<td>Map No. (Figure 4.16-1)</td>
<td>Project Name</td>
<td>Location</td>
<td>Description</td>
<td>Size</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>72</td>
<td>Figueroa Corridor Streetscape Project / City of Los Angeles 2010 Bicycle Master Plan</td>
<td>Figueroa St. and 7th St. to Figueroa St. and King Blvd.</td>
<td>Streetscape</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Federal Courthouse</td>
<td>1st St. and Hill St.</td>
<td>Courthouse</td>
<td>600,000 sf</td>
</tr>
<tr>
<td>74</td>
<td>Department of Water and Power Elysian Park-Downtown Water Recycling Projects</td>
<td>Elysian Park to University of Southern California</td>
<td>Recycled water pipes and facilities</td>
<td></td>
</tr>
</tbody>
</table>

sf = square feet

City of Los Angeles, Department of Public Works, Bureau of Engineer, June 2016.
Figure 4.16-1. Related Projects Map
Effect CUM-2: Cumulative Effects

**Not Adverse.** A cumulative effects analysis is required whenever an EA is prepared. A project must have a direct and/or indirect effect on a specific resource to exert a cumulative influence. If no direct and/or indirect effect to a specific resource is expected, there is no need to consider cumulative effects to that resource. As previously discussed, the Project would result in moderate adverse effects related to operational noise and operational safety.

**Noise.** Direct moderate adverse effect has been identified related to operational noise at two multi-family residential buildings on West 11th Street between Grand Avenue and Hope Street (R23) and the Kawada Hotel (R35). Regarding the multi-family residential buildings, the impacted units are currently exposed to street traffic noise levels that are higher than the predicted streetcar operational noise. Regarding the hotel, the predicted streetcar noise level increases the existing level by less than 1 decibel at the exterior of 15 rooms in the upper levels of the building. Refer to Section 4.11, Noise and Vibration, for additional details related to intersection delays.

The increased noise levels are attributable to growth in background vehicular traffic, not streetcar operations. The Project would act to reduce vehicular traffic, thereby reducing the primary source of noise along the alignment. Therefore, the Project would not result in an adverse cumulative effect related to operational noise.

**Safety.** Mitigation would substantially reduce adverse effects related to bicycle safety. The Project would involve the installation of a fixed rail guideway within the roadway, which may present hazards for cyclists traveling parallel to, or across, the railway. Although the rail itself would be vertically flush with the road surface, there would be a horizontal gap between the track and the surrounding pavement, which is known as the "flangeway." The flangeway may be wider than the width of a typical bicycle tire, particularly the tires used on road bicycles, and therefore bicycle tires can be caught in the flangeway if the bicycle is traveling too close to and parallel, or close to parallel, to the flangeway. Refer to Section 4.12, Safety and Security, for additional details related to bicycle safety.

Bicycle infrastructure in the study area is governed by the City of Los Angeles 2010 Bicycle Plan, a component of Mobility Plan 2035. The "tire in-track" issue would be a potential hazard for bicyclists traveling along Broadway (from 1st to 11th Streets) and Hill Street (from 4th to 1st Streets). In a cumulative context, the study area includes a comprehensive bicycle network with a variety of alternate routes. Bicycle lanes (Class II and buffered) exist on parallel adjacent streets, including Main, Spring, and Olive Streets. In addition, safety hazards for cyclists would be lessened with the implementation of Mitigation Measure TRAF-O1, which includes signage, pavement markings instructing cyclists how to cross tracks safely and other potential safety measures. Therefore, the Project would not result in an adverse cumulative effect related to safety.

### 4.17 Permits and Approvals

Implementation of the Project would require discretionary actions and permits from the following agencies.

- Federal Transit Administration—Finding of No Significant Impact, which commits FTA and the grant applicant to all avoidance measures included in the EA.
• California Public Utilities Commission—Approval regarding safety of rail crossings; the Project
design related to tracks, overhead structures, and site planning; and some operational
requirements.
• Los Angeles Department of Public Works, Bureau of Engineering (local lead agency)—Approval
of all engineering drawings and street-widening plans, related to work within the public
right-of-way.
• Los Angeles Department of Transportation—Approval of traffic signal/transit priority system
improvements and street restriping plans; temporary street closures and haul routes.
• Los Angeles Department of Building and Safety—Issuance of grading haul permits, building
permits, certification of occupancy, etc., for improvements such as the MSF and TPSS off the
public right-of-way.
• Los Angeles Department of Public Works, Bureau of Street Services—Responsibility for street
maintenance and approvals related to landscape architecture and urban forestry issues.
• Los Angeles Department of Public Works, Bureau of Street Lighting—Approval of lighting
design.
• City Planning Department:
  o Public Benefits Project approval.
  o Approval of Project subject to Urban Design Studio recommendations and Downtown
    Design Guide.
• Board of Police Commissioners—Approval for certain construction activities during nighttime
hours, on weekends, and over holiday periods, pursuant to LAMC Section 41.40(j).

Additional actions as determined to be necessary.
Chapter 5.0
Public and Agency Coordination

5.1 Public and Agency Coordination for the EA

A formal The Notice of Availability for a 30-day public review was made through display advertisements placed in the Federal Register and the Los Angeles Downtown News (print and digital versions). The Project is located in City Council District 14, which is represented by City Councilmember Jose Huizar. A press release was prepared and sent to City Councilmember Jose Huizar's office for distribution to the media. The release was also sent to individuals and organizations known to have interest in the Project, or type of project, and local bloggers. The EA is being circulated for review and comment by the public and other interested parties, agencies, and organizations for 30 calendar days starting July 23, 2018 and ending on August 21, 2018. The EA is available at the following locations.

- City of Los Angeles, Department of Public Works, Bureau of Engineering, Environmental Management Group, 1149 South Broadway, 6th Floor, CA 90015. Contact: William Jones at (213) 485-5760, fax: (213) 847-0656
- Los Angeles Central Public Library, 630 West 5th Street, Los Angeles, CA 90071
- Little Tokyo Branch Library, 203 South Los Angeles Street, Los Angeles, CA 90012
- Project website—http://eng.lacity.org/historic_streetcar

All documents referenced in the EA are available for review (either as included in the Reference Library CD and/or provided by request as directed to William Jones at LABOE).

To receive local public input and comment on this EA, LABOE will hold a public hearing on August 2, 2018 at 100 South Main Street, Los Angeles, CA 90012, to give an overview of the Project and solicit comments on this EA. Comment can be provided at the hearing and written comments can be provided from July 23 through August 21, 2018, written comments should be provided to:

City of Los Angeles, Department of Public Works
Bureau of Engineering, Environmental Management Group
1149 South Broadway, 6th Floor
Los Angeles, CA 90015
Attention: William Jones
Email: eng.lastreetcarproject@lacity.org

5.2 Public and Agency Coordination Summary for the Draft EIR

Metro hosted a series of early scoping meetings and community updates as part of the initial environmental review process. An inter-agency meeting was held on May 4, 2011, and included representation from a number of City of Los Angeles departments, Metro, the California Department of Transportation, Metrolink, CPUC, and FTA. Metro briefed the Downtown Los Angeles Neighborhood Council (DLANC) on May 10, 2011. Finally, a formal “pre-scoping” open house and
hearing was held on May 17, 2011, at the Los Angeles Theatre in Downtown Los Angeles. Refer to Appendix C for the Scoping Summary Report.

In its role as the Lead Agency, LABOE distributed a Notice of Availability of the Draft EIR for a 45-day public review period, which closed on August 8, 2016, to 107 agencies on June 24, 2016. The Notice of Availability was sent to all known responsible agencies, numerous City departments that could have interest or discretionary approval regarding the Project, and individuals and organizations known to have interest in the Project, or type of project. Display advertisements were placed in the Los Angeles Downtown News in both the print and digital editions; the advertisement appeared in the July 5 edition and the digital advertisements ran online between July 5 and July 11, 2016. In addition, the Notice of Availability, copies of the Executive Summary, and CDs of the Draft EIR were sent to the State of California Governor’s Office of Planning and Research, State Clearinghouse, for further responsible agency distribution. The Notice of Availability was also posted with the Office of the City Clerk and Los Angeles County Clerk office.

A press release was prepared and sent to Councilmember Huizar’s office for distribution to the media. The release was also sent to local bloggers, several of whom posted information about the meeting. A meeting notice was sent out via Councilmember Huizar’s office e-newsletter on July 8 and constituents were kept informed via the Councilmember’s twitter page.

On July 12, 2016, the LABOE held a public hearing at the Ronald F. Deaton Civic Auditorium, LAPD, at 100 West 1st Street, Los Angeles, California 90012, to give an overview of the proposed Project and solicit comments on the EIR. A total of 2,300 flyers providing information about the hearing were mailed to stakeholders immediately adjacent to the Project alignment. A total of 300 flyers were distributed to businesses along the alignment. Twenty-seven people attended the public hearing and four people spoke for the record. A court reporter was present to take comments, and Spanish language translation service was also made available. Three oral comments were received at the public hearing.

Following the close of the public review period, the City received 44 individual comment letters from agencies, interested parties, and the public regarding the Draft EIR. The comment letters were primarily related to the selection of the LPA, MSF locations, traffic, obstructed views of historic resources, pedestrian and bicycle safety, construction air pollutant emissions, and noise. The Final EIR responded to these written comments and provides any minor edits to the Draft EIR as well as providing the Mitigation Monitoring and Reporting Program under separate cover.

The Notice of Availability was sent to representatives of the Gabrieleno Band of Mission Indians, Gabrielino Tongva Tribe, and the Tongva Ancestral Territorial Tribal Nation. No related comment letters were received by the City.
Chapter 6.0
References, Organizations, and Persons Consulted


City of Los Angeles. 1995. Los Angeles Citywide General Plan Framework Draft Environmental Impact Report. Figure GS-1 and Figure GS-6. January 19.


Chapter 7.0
List of Preparers

7.1 Public and Non-Profit Agencies

Federal Transit Administration
Leslie T. Rogers, Regional Administrator
Raymond Tellis, Senior Transportation Program Specialist
Mary Nguyen, Environmental Protection Specialist (LAMO)
Charlene Lee Lorenzo, Transportation Program Specialist
Adam Stephenson, Transportation Program Specialist
Stacy Alameida, Intergovernmental Personnel Act (IPA)
Ted Matley, Community Planner

City of Los Angeles Department of Public Works, Bureau of Engineering
Reza Shahmirzadi, P.E., S.E., Downtown Los Angeles Streetcar Division, Program Manager
William Jones, Environmental Management Group, Environmental Supervisor II

City of Los Angeles Department of Transportation
Seleta Reynolds, LADOT General Manager
Kari Derderian, Supervising Transportation Planner II, Specialized Transit & Grants Division
Tomas Carranza, PE, Planning & Land Use Review, Senior Transportation Engineer
Sean Skehan, Principal Transportation Engineer, Operations Group
Bill Shao, Senior Transportation Engineer, ATSAC Operations Division
Martha D'Andrea, Supervising Transportation Planner I, Specialized Transit & Grants Division

Los Angeles Streetcar, Inc. (LASI)
Steve Needleman, Chairman
Shiraz Tangri, Esq., Meyers Nave
Ryan M. Leaderman, DLA Piper LLP (US)

Los Angeles County Metropolitan Transportation Authority
David Mieger, Executive Officer
Peter Carter, Transportation Planning Manager
Gary Byrne, Transportation Planner
7.2 Consultants

Terry A. Hayes Associates Inc.

Terry A. Hayes, Chief Executive Officer and Oversight
Sam Silverman, Senior Associate and Project Manager
Allyson Dong, Planner and Assistant Project Manager
Anders Sutherland, Environmental Scientist
Keiran Bartholow, Assistant Planner
Andy Uk, Assistant Planner
Rosa Soria, Assistant Planner
Natasha Mapp, Editor

ICF International

Lee Lisecki, Project Director
Gary Petersen, Senior Project Manager
Namrata Cariapa, Deputy Project Manager
Keith Cooper, Air Quality
Rick Starzak, Cultural Resources
Jessica Feldman, Cultural Resources
Elizabeth Hilton, Cultural Resources
Mark Robinson, Archaeology and Paleontology
Stephen Bryne, Archaeology
Peter Feldman, Environmental Planner
Tamseel Mir, Environmental Planner
Rusty Whisman, Environmental Planner
Andrew Johnson, Environmental Planner
Alison Rondon, Environmental Planner
Elizabeth Irvin, Senior Lead Editor
John Mathias, Senior Lead Editor
Saadia Byram, Senior Lead Editor
Jenelle Mountain-Castro, Publication Specialist
Brittany Buscombe, GIS

HDR Engineering, Inc.

Jim Hecht, Project Manager

Intueor Consulting, Inc.

Farid Naguib, Traffic
Wahid Farhat, Traffic

ATS Consulting

Steven Wolf, Noise and Vibration