

**Regional Connector Transit Corridor  
Draft Environmental Impact Statement/  
Draft Environmental Impact Report**

**APPENDIX L**



**TRANSPORTATION**



# **Regional Connector Transit Corridor Transportation Technical Memorandum**

**Transit, Traffic Circulation, Parking, and  
Non-motorized Transportation**

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**Prepared for**

**Los Angeles County Metropolitan Transportation Authority**

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## ACRONYMS

AA	Alternatives Analysis
ADT	Average Daily Traffic
AM	Morning
AVTA	Antelope Valley Transit Authority
CALTRANS	California Department of Transportation
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FTA	Federal Transit Administration
HCM	Highway Capacity Manual
JANM	Japanese American National Museum
LADOT	Los Angeles Department of Transportation
LOS	Level of Service
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
L RTP	Long Range Transportation Plan
Metro	Los Angeles County Metropolitan Transportation Authority (LACMTA)
NEPA	National Environmental Policy Act
OCTA	Orange County Transportation Authority
PM	Afternoon

TBM	Tunnel boring machine
TRB	Transportation Research Board
TSM	Transportation Management System
v/c	Volume to capacity ratio
VPD	Vehicles Per Day

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## 1.0 SUMMARY

This technical memorandum addresses potential transportation impacts of the Regional Connector Transit Corridor project, and is one of a series of technical reports prepared in support of the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR) for the project. The project would directly link the 7<sup>th</sup> Street/Metro Center Station (the Metro Blue Line and future Metro Expo Line termini located at 7<sup>th</sup> and Figueroa Streets) to the Little Tokyo/Arts District Station (Metro Gold Line Station) at 1<sup>st</sup> and Alameda Streets. By linking the Metro Expo Line, Metro Gold Line and Metro Blue Line, Metro could provide continuous service across the region in two different directions: north-south between the Cities of Azusa and Long Beach and east-west between the City of Santa Monica and I-605 without the need for passengers to transfer.

The alternatives evaluated for the Regional Connector Transit Corridor project include:

- No Build Alternative
- Transportation System Management (TSM) Alternative
- At-Grade Emphasis Light Rail Transit (LRT) Alternative
- Underground Emphasis LRT Alternative
- Fully Underground LRT - Little Tokyo Variation 1
- Fully Underground LRT - Little Tokyo Variation 2

Section 2.0 of this report describes the history and background of the Regional Connector Transit Corridor Project in greater detail. This section also provides more detail on the proposed alternatives and describes the basis of this transportation evaluation.

The traffic analysis methodology used significance thresholds established by the City of Los Angeles Department of Transportation (LADOT). The alternatives are analyzed for the horizon year of 2035.

Traffic count data were collected at 85 intersection locations and 66 roadway segments. An existing conditions analysis was performed for each component of the transportation environment, which consists of transit, traffic circulation, parking and other non-motorized modes such as pedestrians and bicycles.

An on-street parking inventory was also performed for roadway segments that would be affected by the proposed alignment to identify the number of parking and loading spaces that

may potentially be displaced due to short-term construction activity and long-term project impacts.

Potential impacts for each alternative are detailed by each component of the transportation environment in Section 5.0. Future conditions were developed each project alternative to determine potential project-related impacts, potential mitigation measures, and any residual impacts after mitigation.

The At-Grade Emphasis LRT Alternative would have greater impacts on transit, traffic circulation, parking and other modes than for the other build alternatives (excluding the No Build and TSM Alternatives). With respect to traffic circulation, Table 1-1 summarizes the number of intersections with levels of service (LOS) E and F during the AM and PM peak hours in the horizon year of 2035.

Alternative Under Consideration	AM Peak Hour		PM Peak Hour	
	LOS E	LOS F	LOS E	LOS F
No Build	6	8	13	15
TSM	6	8	12	16
At-Grade Emphasis	7	13	12	25
Underground Emphasis	7	9	13	17
Fully Underground – Little Tokyo Variation 1	7	8	13	14
Fully Underground – Little Tokyo Variation 2	7	8	13	14

Intersections that exceed the significance threshold when compared to the No Build Alternative are considered to be impacted by the proposed project. The number of potentially impacted intersections for each alternative under consideration are summarized in Table 1-2. Potential mitigation measures are proposed in Section 6.0 and the number of intersections that remain impacted (residual impacts) after implementation of the proposed mitigation measures are also shown in Table 1-2.

In summary, no unavoidable significant adverse impacts have been identified if mitigation measures are implemented for transit, parking, pedestrians, and bicycles. Traffic circulation may experience impacts under all build alternatives—one or more intersections would

continue to be impacted to significant levels (residual impacts) after mitigation during one or both peak traffic hours (morning and afternoon).

<b>Table 1-2. Number of Impacted Intersections With and Without Mitigation</b>				
<b>Alternative Under Consideration</b>	<b>Impacted Intersections</b>		<b>Impacted After Mitigations</b>	
	<b>AM Peak</b>	<b>PM Peak</b>	<b>AM Peak</b>	<b>PM Peak</b>
No Build	-----	-----	-----	-----
TSM	8	9	0	0
At-Grade Emphasis	18	26	11	15
Underground Emphasis	3	7	2	3
Fully Underground – Little Tokyo Variation 1	1	3	1	0
Fully Underground – Little Tokyo Variation 2	1	3	1	0





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## 2.0 INTRODUCTION

### 2.1 Background

The Regional Connector Transit Corridor project is a vital core piece of public transit infrastructure that would enhance investments already made in the region's light rail system. It would link four distinct travel corridors covering over 50 miles across the County through the center of downtown Los Angeles.

The Los Angeles County Metropolitan Transportation Authority (Metro) has envisioned this connection for nearly two decades beginning in the late 1980s/early 1990s. At that time the Long Beach and Pasadena light rail branches were envisioned to connect in downtown Los Angeles and operate as a single line. However, the downtown segment was not built, and passengers must currently transfer to the Metro Red or Purple Lines to move between the two branches, or to reach many major central business district destinations.

Increased transit ridership, traffic congestion, and major regional developments occurring in downtown Los Angeles have created a need to tie the light rail system together. The recent opening of Metro's Gold Line to East Los Angeles and planned openings of the extension to Azusa and the Metro Expo Line to Santa Monica further emphasize this need.

The Regional Connector Transit Corridor project offers a direct high-capacity link to tie the regional branches of Metro's LRT system together through downtown. It would directly link 7<sup>th</sup> Street/Metro Center Station to the Little Tokyo/Arts District Station.

The Regional Connector project would include three to four new downtown stations and create direct light rail transit connections between the Cities of Long Beach and Azusa and I-605 and the City of Santa Monica without the need to transfer. It would also provide passengers with direct transit into the heart of the business and civic districts. Metrolink, Amtrak, and Metro Red and Purple Line passengers would have an option to transfer to the Long Beach-Azusa and I-605-Santa Monica trains and reach portions of the downtown area not presently served by Metro Rail.

The Regional Connector would provide transit benefits residents across the County, and can be accomplished by constructing just 1.8 miles of dual tracks. The proposed project would provide faster, more transit destinations by providing greater access to the downtown area and mobility region-wide.

### 2.2 Alternatives Considered

An Alternatives Analysis planning process was undertaken to identify and screen potential transportation alternatives in light of the project purpose and transportation need, goals, and objectives within the Regional Connector Transit Corridor project area. This process was

completed and approved by Metro in January 2009 and included community and public agency feedback at meetings and public workshops.

The alternatives analyzed in this technical memorandum emerged from this planning process, and were confirmed and refined based on public input from the scoping process. All of the approved alternatives were analyzed in this technical memorandum for the horizon year of 2035. Each of the alternatives is described in the following subsections.

### 2.2.1 No Build Alternative

The No Build Alternative, as defined by the Federal Transit Administration (FTA), represents the baseline case and consists of existing and committed elements of the region's transportation plan, excluding the proposed Regional Connector Transit Corridor project. Consequently, the No Build Alternative is focused on preservation of existing services. The No Build Alternative does not include any major service improvements or new transportation infrastructure beyond what is identified in Metro's 2009 Long Range Transportation Plan (LRTP).

By the projection year of 2035, the Metro Expo Line to Santa Monica, the Metro Crenshaw Line, the Metro Purple Line to Westwood, and the Metro Gold Line to Azusa will have opened and bus services will have been reorganized and expanded to provide connections with these new rail lines. Otherwise, the transit network within the project area would be largely the same as it is now except for potential improvements to frequency of service.

### 2.2.2 Transportation System Management (TSM) Alternative

The TSM Alternative includes all of the provisions of the No Build Alternative, plus two new express shuttle bus lines linking the 7<sup>th</sup> Street/Metro Center Station and Union Station. These buses would run frequently, perhaps just a few minutes apart, especially during peak hours. The buses may also have traffic signal priority similar to the Metro Rapid system, where the traffic signal control system grants longer green lights to oncoming transit vehicles.

Enhanced bus stops would be located every two to three blocks to maximize coverage of the area surrounding the routes. Each route would operate every 2.5 minutes during the peak hours and every 5 minutes during the off-peak hours. The proposed two routes are:

- *Upper Grand Route (Grand/Temple/Los Angeles Alignment)* - From the 7<sup>th</sup> Street/Metro Center Station, buses would proceed east on 7<sup>th</sup> Street, north on Olive Street, west on 5<sup>th</sup> Street, north on Grand Avenue, east on Temple Street, and then north on Los Angeles Street to Union Station. As a variation, buses could use Alameda Street between Temple Street and Union Station to allow a stop at Temple and Alameda Streets, near the Little Tokyo/Arts District Station. The alignment is assumed to follow the same route as part of the existing LADOT DASH Route B

service, proceeding from 7<sup>th</sup> Street/Metro Center Station to Union Station using Grand Avenue, Temple Street, and Los Angeles Street. Shuttle buses would run less than 8 minutes apart and cover the Bunker Hill and Civic Center areas.

- *Lower Grand Route (Figueroa/Flower/2<sup>nd</sup>/3<sup>rd</sup>/Alameda Alignment)* - This route would use the existing northbound bus-only lanes on Figueroa Street and mixed flow lanes on 2<sup>nd</sup> and 3<sup>rd</sup> Streets that are lightly used by other bus lines. From 7<sup>th</sup> Street/Metro Center Station, buses would proceed north on Figueroa Street, west on 2<sup>nd</sup> Street, and north on Alameda Street to Union Station. To return to the 7<sup>th</sup> Street/Metro Center Station, buses would travel south on Alameda Street, west on 3<sup>rd</sup> Street, and south on Flower Street. The alignment passes by both the Little Tokyo/Arts District Station and Union Station, and provides coverage of Little Tokyo and the southern edge of the Civic Center.

### 2.2.3 At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative would provide a direct connection from the existing underground 7<sup>th</sup> Street/Metro Center Station to the Metro Gold Line at Temple and Alameda Streets, including three new station locations. This alternative extends from the underground 7<sup>th</sup> Street/Metro Center Station, heads north under Flower Street, surfaces to an at-grade alignment north of 4<sup>th</sup> Street, crosses 3<sup>rd</sup> Street at grade, enters Bunker Hill through a tunnel, and turns northeast, entering through a new entrance into the existing 2<sup>nd</sup> Street Tunnel.

The alignment continues at grade along 2<sup>nd</sup> Street and splits into a one-way at-grade couplet configuration traveling north on Main and Los Angeles Streets (one track on each roadway). The tracks then head east on Temple Street, realign into a dual-track configuration just east of Los Angeles Street, and connect to the Metro Gold Line in a three-way junction north of the Little Tokyo/Arts District Station on Alameda Street. The three stations identified for this alternative include an underground station south of 5<sup>th</sup> Street under Flower; an underground station between 2<sup>nd</sup>/Hope and 3<sup>rd</sup>/Flower; and an at-grade southbound only station on Main Street and an at-grade northbound only station on Los Angeles Street – both are located on the eastern side of the streets between Temple and 1<sup>st</sup> Streets.

Due to the high volume of trains that would traverse the Regional Connector and high traffic volumes on Alameda Street, an automobile underpass and potential pedestrian overpass would be constructed at the intersection of Temple and Alameda Streets. This would eliminate potential pedestrian-train and automobile-train conflicts. A pedestrian bridge could also be constructed between the 2<sup>nd</sup>/Hope Street station and Upper Grand Avenue to enhance the connection to Bunker Hill.

This alignment includes both underground and at-grade configurations, with 46 percent of the route underground, serving the Civic Center, Grand Avenue, and the Financial District. Conversion of 2<sup>nd</sup> Street between Hill Street and Los Angeles Street to a pedestrian-friendly transit mall is assumed. However, local access would be maintained to serve the adjacent businesses and office buildings.

To implement this alternative, the number of traffic lanes on 2<sup>nd</sup> Street would be reduced to one westbound lane between Hill Street and Main Street and on-street parking would be eliminated. As a result, traffic is likely to divert to adjacent parallel streets such as 1<sup>st</sup> Street, 3<sup>rd</sup> Street for westbound through traffic, and 4<sup>th</sup> Street for eastbound through traffic. The roadway capacity along these adjacent parallel streets would remain unchanged from current conditions. Vehicular traffic congestion along these streets would likely increase.

For the at-grade segments of this alternative, the two LRT tracks would typically occupy a 26-foot-wide surface right-of-way bordered by mountable curbs. It is expected that this width would increase at station areas. Vehicular and pedestrian crossings would be limited to traffic signal-controlled intersections, with signal cycle length and phasing modified to provide adequate green time for LRT vehicles to safely cross.

For safety reasons, no uncontrolled mid-block vehicular crossings of the tracks would be permitted. Trains would operate on a north-south route between Azusa and Long Beach, running every five minutes during the peak hours. Trains would also operate on an east-west route between the vicinity of I-605 and Santa Monica, running every five minutes during the peak hours. This would yield trains running at every 2.5 minutes in each direction through the project area.

#### **2.2.4 Underground Emphasis LRT Alternative**

The Underground Emphasis LRT Alternative would be completely underground, except for a single at-grade crossing at the intersection of 1<sup>st</sup> and Alameda Streets. The alignment would have three new station locations.

This alternative would connect directly to the tracks at the 7<sup>th</sup> Street/Metro Center Station and continue north underneath Flower Street to 3<sup>rd</sup> Street and northeast to 2<sup>nd</sup> and Hope Streets. Tracks would then proceed east underneath the 2<sup>nd</sup> Street Tunnel and the 2<sup>nd</sup> Street roadway to Central Avenue. There are three underground stations identified for this alternative. One underground station is located between 4<sup>th</sup> and 5<sup>th</sup> Streets under Flower; a second underground station is located between 2<sup>nd</sup>/Hope and 3<sup>rd</sup>/Flower Streets; and a third station can be located along 2<sup>nd</sup> Street either between Broadway and Spring or Los Angeles and Main Streets.

In the vicinity of Central Avenue the tracks would veer northeast into a new portal on private property bounded by 1<sup>st</sup> Street, Alameda Street, 2<sup>nd</sup> Street, and Central Avenue. It is expected

that a portion of this property would be acquired to construct the portal and is one of two sites that could potentially be used as a staging area for tunnel construction beneath 2<sup>nd</sup> Street with a Tunnel Boring Machine (TBM).

The tracks would then enter the intersection of 1<sup>st</sup> and Alameda Streets at-grade in the same type of three-way junction planned for the At-Grade Emphasis LRT Alternative. Due to the high volume of trains that would traverse the Regional Connector and the high traffic volumes on Alameda Street, an automobile underpass and potential pedestrian overpass would be constructed at the intersection of 1<sup>st</sup> and Alameda Streets. This would minimize pedestrian-train and automobile-train conflicts. A pedestrian bridge could also be constructed between the 2<sup>nd</sup>/Hope Street station and Upper Grand Avenue to enhance the connection to Bunker Hill.

Due to its mostly underground configuration, the Underground Emphasis LRT Alternative would not dramatically compromise existing roadway capacity. The alignment of this alternative could affect surface traffic and pedestrian circulation at the intersection of 1<sup>st</sup> and Alameda Streets, where the LRT alignment would operate in an at-grade configuration. Consequently, vehicular circulation patterns along downtown streets adjacent to most of the alignment would continue to operate under current traffic flow patterns.

The only exceptions would be 1) at Hope Street in the vicinity of General Thaddeus Kosciuszko Way, where two adjacent intersections would be consolidated into one intersection at South Hope and 2<sup>nd</sup> Streets; and 2) a permanent roadway reconfiguration involving the removal of one traffic lane along Flower Street in the vicinity of the Flower/5<sup>th</sup>/4<sup>th</sup> Street station to accommodate the station pedestrian portal entrances along the sidewalk.

Trains would operate on a north-south route between Azusa and Long Beach, running every five minutes during the peak hours. Trains would also operate on an east-west route between the I-605 and Santa Monica, running every five minutes during the peak hours. This would yield trains running at every 2.5 minutes in each direction within the Regional Connector segment.

### **2.2.5 Fully Underground LRT Alternative – Little Tokyo Variation 1**

The Fully Underground LRT Alternative – Little Tokyo Variation 1 would provide four new stations and a direct, entirely underground connection from the 7<sup>th</sup> Street/Metro Center Station to the existing Metro Gold Line tracks to the north and east of 1<sup>st</sup> and Alameda Streets. The alignment would extend from the 7<sup>th</sup> Street/Metro Center Station under Flower Street to 2<sup>nd</sup> Street and then proceed east underneath the 2<sup>nd</sup> Street Tunnel and 2<sup>nd</sup> Street roadway to Central Avenue. At 2<sup>nd</sup> Street and Central Avenue, the tracks would continue underground heading northeast under 1<sup>st</sup> and Alameda Streets.

The four underground stations identified for this alternative include the underground station between 4<sup>th</sup> and 5<sup>th</sup> Streets under Flower Street; the underground station between 2<sup>nd</sup>/Hope and 3<sup>rd</sup>/Flower Streets; the underground station under 2<sup>nd</sup> Street between Broadway and Spring; and an underground station within the property bounded by 1<sup>st</sup>, 2<sup>nd</sup>, Central and Alameda Streets.

A three-way junction would be constructed underground beneath the 1<sup>st</sup> and Alameda Streets intersection. To the north and east of the junction, trains would rise to the surface through two new portals to connect to the tracks heading north to Azusa and east towards I-605. One portal would be located northeast of the Little Tokyo/Arts District Station rising to the surface within the City of Los Angeles Department of Water and Power Maintenance Yard and connecting to the existing LRT bridge over the US-101 freeway.

The second portal would be located within 1<sup>st</sup> Street between Alameda and Vignes Streets. The tracks would rise to the east within this second portal and connect at-grade to the existing tracks to East Los Angeles.

Again, the Fully Underground Alternative – Little Tokyo Variation 1 would be operated entirely underground from east of the intersection of 1<sup>st</sup> and Alameda Streets to the 7<sup>th</sup> Street/Metro Center Station. A pedestrian bridge could be constructed between the 2<sup>nd</sup>/Hope Street Station and Upper Grand Avenue to enhance the connection to Bunker Hill.

Roadway reconfigurations would include:

- A permanent roadway reconfiguration consisting of the removal of one traffic lane and the parking on one side along Flower Street in the vicinity of the Flower/5<sup>th</sup>/4<sup>th</sup> Street station. Removal of this lane would accommodate the station pedestrian portal entrances along the sidewalk.
- Street widening and sidewalk modifications would be required on 1<sup>st</sup> Street in the vicinity of the portal.
- At Hope Street in the vicinity of General Thaddeus Kosciuszko Way, where two adjacent intersections would be consolidated into one at South Hope and 2<sup>nd</sup> Streets.
- The newly installed traffic signal at 1<sup>st</sup> and Hewitt Streets would be removed and therefore, through traffic movements along Hewitt Street would no longer be permitted at 1<sup>st</sup> Street, and no left turns to or from Hewitt Street would be possible.

Otherwise, the alignment would not affect surface traffic or pedestrian circulation on 1<sup>st</sup> Street between Alameda Street and the 1<sup>st</sup> Street bridge and vehicular circulation patterns along downtown streets adjacent to most of the alignment would continue to operate under current traffic flow patterns.

Trains would operate on a north-south route between Azusa and Long Beach, running every five minutes during the peak hours. Trains would also operate on an east-west route between the I-605 and Santa Monica, running every five minutes during the peak hours. This would yield trains running at every 2.5 minutes in each direction.

### **2.2.6 Fully Underground LRT Alternative – Little Tokyo Variation 2**

The Fully Underground LRT Alternative – Little Tokyo Variation 2 is similar to Variation 1 except two portals instead of one, each containing one track, would rise to the east within the widened median of 1<sup>st</sup> Street. The portal containing the westbound track would be located between Alameda and Garey Streets. The portal containing the eastbound track would be located adjacent to the westbound track between Hewitt and Vignes Streets.

The Fully Underground Alternative – Little Tokyo Variation 2 would be located entirely underground from the 7<sup>th</sup> Street/Metro Center Station to east of the intersection of 1<sup>st</sup> and Alameda Streets. The same alterations to the roadways and traffic circulation would occur for this alternative as was described for the Fully Underground LRT Alternative – Little Tokyo Variation 1.

The four underground stations identified for this alternative include the underground station between 4<sup>th</sup> and 5<sup>th</sup> Streets under Flower Street; the underground station between 2<sup>nd</sup>/Hope and 3<sup>rd</sup>/Flower Streets; the underground station under 2<sup>nd</sup> Street between Broadway and Spring; and an underground station within the property bounded by 1<sup>st</sup>, 2<sup>nd</sup>, Central and Alameda Streets.

Trains would operate on a north-south route between Azusa and Long Beach, running every five minutes during the peak hours. Trains would also operate on an east-west route between the I-605 and Santa Monica, running every five minutes during the peak hours. This would yield trains running at every 2.5 minutes in each direction.





## 3.0 METHODOLOGY FOR IMPACT EVALUATION

This section describes the methodology and assumptions used to evaluate and analyze potential impacts to the transportation environment due to the proposed Regional Connector Transit Corridor project. The analysis evaluated transportation impacts from the project on transit, traffic circulation, parking, and other modes such as pedestrians and bicycles.

### 3.1 Standards of Significance

CEQA guidelines define “significant effect” or “significant impact” as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project. The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. There are few quantitative standards of significance related to transportation effects. The measurement and prediction of level of service at potentially affected intersections is a standard that is used to evaluate the significance of potential traffic impacts. Predicted changes in level of service provide indications of how well road-based movements may function under the different alternatives, which may have implications for vehicular traffic, and certain types of transit and non-motorized transportation.

Significant impacts generated by the build alternatives were identified by comparing results of the level of service analyses. Each future build alternative evaluated was compared to the No Build Alternative, which is considered the baseline condition. The reason for this comparison is to determine potential significant impacts due to the proposed project.

The threshold of significance used to identify significant traffic impacts under both NEPA and CEQA are based upon guidelines set forth by LADOT in the LADOT Traffic Study Policies and Procedures revised in March 2002. The significance threshold at an intersection is based on the amount of change in overall delay between an action alternative and the No Build Alternative. An intersection is considered to be significantly impacted by the project if the change in overall delay from the No Build Alternative is equal to or greater than the criteria shown in Table 3-1.

### 3.2 Project Area Evaluated

The project area is bounded by Figueroa Street on the west, the Santa Ana Freeway (US-101) on the north, Alameda Street on the east, and 8<sup>th</sup> Street on the south. Most of the roadway segments and intersections evaluated are located along the alignments of the proposed shuttle bus service for the TSM Alternative and the light rail transit service for the At-Grade Emphasis and Underground Emphasis Alternatives. In addition, this evaluation included locations on parallel adjacent arterials potentially affected by a potential shift in traffic caused by reducing the number of travel lanes along 2<sup>nd</sup> Street.

<b>Final Intersection LOS with Project</b>	<b>Change in Delay (in seconds) from the No Build Alternative</b>
LOS A	-----
LOS B	-----
LOS C	6.0
LOS D	4.0
LOS E	2.5
LOS F	2.5

*Source: LADOT 2002*

### 3.2.1 Roadway Network

Based on the City of Los Angeles' General Plan Circulation Element, roadways have functional classifications that range from Major Highway, to Secondary Highway, to Collector Street. A brief description of these types of roadways is provided below.

- A Major Arterial (Class I) has three full-time through lanes in each direction, one part time parking lane in each direction and one median/left turn lane with 12-foot sidewalks on both sides.
- A Major Arterial (Class II) has two full-time through lanes in each direction, one part time parking lane in each direction, and one median/left turn lane with 12-foot sidewalks on both sides. Pedestrian priority segments include 17-foot sidewalks on both sides.
- A Secondary Arterial has two full-time through lanes in each direction, all-day permitted parking, and one median/left turn lane with ten-foot sidewalks on both sides. Pedestrian priority segments include 15-foot sidewalks on both sides.
- A Standard Collector Street has one full time lane in each direction, one full-time parking lane in each direction and ten-foot sidewalks on both sides.

### 3.3 Evaluation Methodology

A potential list of roadway segments and intersection locations to be studied was identified and presented to the affected agencies including Metro and LADOT for review and

concurrency. The initial list consisted of 70 intersection locations; however, after LADOT's review, an additional 15 intersection locations were included in the traffic analysis.

Initial information was collected from LADOT, but it was determined that most of the available count data were older than 2 or 3 years. Therefore, new counts were conducted at all 85 intersection locations and 66 roadway segments. Daily traffic volumes along the roadway segments and the morning (AM) and afternoon (PM) peak period turning movement counts at each intersection were collected by traffic surveyors on a typical weekday when schools were in session.

Existing transit services within the project area that parallel the Regional Connector alignment were identified and tabulated to show destinations, existing headways, service characteristics, and operating time periods. An on-street parking evaluation was conducted to assess the number of spaces that may be removed due to each one of alternatives. The analysis included a field inventory of the number of available on-street parking and loading spaces and identification of peak period parking restrictions, if applicable.

Existing traffic operating conditions were evaluated by performing a level of service (LOS) analysis for the roadway segments and intersections. LOS is a qualitative measure used to describe the condition of traffic flow, ranging from excellent conditions at LOS A to overloaded conditions at LOS F. LOS D is typically recognized as the minimum acceptable level of service in urban areas. Table 3-2 defines each level of service and is based on each roadway's specific volume-to-capacity ratio.

Each study intersection was analyzed using the Highway Capacity Manual delay methodology for signalized and un-signalized intersection. The LOS designation is based on an overall average vehicle delay in seconds per vehicle. The LOS criteria thresholds for un-signalized intersection are different than those used for signalized intersections. Table 3-3 provides LOS definitions for un-signalized intersections, including all-way and two-way stop-controlled intersections.

Table 3-4 provides LOS definitions and thresholds used to measure the performance of signalized intersections, where the intersection's LOS designation is also based on overall average vehicle delay in seconds per vehicle.

Traffic forecasts were developed for the horizon year of 2035 by obtaining the travel demand forecasts from the Metro Corridors Base Model and post-processing the information to reflect the anticipated growth within the project area. Forecasts for the No Build Alternative would account for background growth in traffic due to additional regional and sub-regional land use development (cumulative projects) and population growth. These forecasts were used to perform the operational analysis for each horizon year alternative under consideration.

For each potentially impacted location, proposed mitigation measures were developed.

<b>LOS</b>	<b>Volume/Capacity Ratio</b>	<b>Definition</b>
A	0.000 - 0.600	EXCELLENT. Free flow, light volumes.
B	0.601 - 0.700	VERY GOOD. Free to stable flow, light to moderate volumes.
C	0.701 - 0.800	GOOD. Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
D	0.801 - 0.900	FAIR. Approaches unstable flow, moderate to heavy volumes, limited freedom to maneuver.
E	0.901 - 1.000	POOR. Extremely unstable flow, heavy volumes, maneuverability, and psychological comfort extremely poor.
F	>1.000	FAILURE. Forced or breakdown conditions, slow speeds, tremendous delays with continuously increasing queue lengths.

Source: TRB 1980.

<b>LOS</b>	<b>Average Vehicle Delay (in seconds)</b>
A	$\leq 10.0$
B	$> 10.0$ and $\leq 15.0$
C	$> 15.0$ and $\leq 25.0$
D	$> 25.0$ and $\leq 35.0$
E	$> 35.0$ and $\leq 50.0$
F	$> 50.0$

Source: TRB 2005

**Table 3-4. Level of Service Definitions for Signalized Intersections**

LOS	Average Vehicle Delay (in seconds)	Definition
A	$\leq 10.0$	EXCELLENT. No vehicle waits longer than one red light and no approach phase are fully used.
B	$> 10.0$ and $\leq 20.0$	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	$> 20.0$ and $\leq 35.0$	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	$> 35.0$ and $\leq 55.0$	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	$> 55.0$ and $\leq 80.0$	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	$> 80.0$	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

Source: TRB 2005



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## 4.0 AFFECTED ENVIRONMENT

This section identifies the existing conditions for each transportation component being evaluated. The transportation environment consists of transit, traffic circulation, parking, and other modes such as pedestrians and bicycles.

### 4.1 Transit

The Regional Connector is located within the central business district of downtown Los Angeles, which is characterized by the highest concentration of transit service in the county. Ten transit operators operate four existing rail lines (one rail line is under construction) and approximately 110 bus routes throughout the project area. Services vary considerably in speed, frequency and capacity.

The transit operators include Antelope Valley Transit Authority (AVTA), City of Gardena, City of Santa Clarita, City of Santa Monica (Big Blue Bus), Foothill Transit, LADOT, Metro, Montebello Transit, Orange County Transportation Authority (OCTA), and Torrance Transit. The type of service provided includes traditional line-haul bus service, peak-hour freeway express buses, and downtown circulator shuttles.

Although Metro and LADOT carry the majority of passengers, other operators provide peak-hour, peak direction commuter bus service as well. In addition to public transit services, several high-rise office tenants also offer shuttle bus service to Union Station for their employees.

Commuter rail service to downtown Los Angeles is provided primarily by Metrolink and Amtrak, with connections to Metro Rail service at Union Station, which is located 0.1 mile outside of the project area. Most passengers arriving at Union Station on Metrolink are bound for the central business district and presently use the Metro Red Line, LADOT DASH buses, or employer-provided shuttles to complete their trips.

Almost all streets in the downtown area are served during the peak hours, with bus service that has five minute or even higher frequency (headways). The bus service runs in a grid pattern with the predominant flow of passengers being in an east-west orientation, although there are also heavily utilized bus lines that run in the north-south direction. The most heavily-served streets are 1<sup>st</sup> Street, the 4<sup>th</sup> Street/5<sup>th</sup> Street couplet, Hill Street, Broadway, the Main Street/Spring Street couplet, and the Grand Street/Olive Street couplet.

Major bus routes paralleling the Metro LRT lines and providing connections between the project area and the region are shown in the following tables. Each table shows the limits of a bus routes' service, the operating period, and the peak hour frequency. Tables 4-1 and 4-2 summarize the bus routes paralleling the existing Pasadena Gold Line and the existing Gold Line to East Los Angeles service.



**Table 4-1. Bus Routes Paralleling the Existing Pasadena Gold Line Service**

Operator	Line	Mode	Weekday Hours of Operation	Peak Hour Frequency	Route Description
Metro	78/79/378	Local/Limited Stop Bus	5AM-1AM	10 mins	Arcadia via Huntington Dr. and Las Tunas Dr.
Metro	94	Local/Limited Stop Bus	5AM-1AM	5 mins	Sylmar via San Fernando Rd. and Spring Street
Metro	485	Freeway Express Bus	5AM-12AM	20 mins	Altadena via El Monte Busway, Oak Knoll Av. and Lake Av.

**Table 4-2. Bus Routes Paralleling the Existing Gold Line to East Los Angeles Service**

Operator	Line	Mode	Weekday Hours of Operation	Peak Hour Frequency	Route Description
Metro	18	Local Bus	24 Hours	3 mins	Wilshire Center - Montebello via 6 <sup>th</sup> Street and Whittier Bl.
Metro	30/31/330	Local/Limited Stop Bus	24 Hours	4 mins	Pico-Rimpau - Monterey Park via Pico Bl. and E 1 <sup>st</sup> Street
Metro	62	Local Bus	5AM-11PM	15 mins	Hawaiian Gardens via Telegraph Rd.
Metro	66/366	Local/Limited Stop Bus	4AM-1AM	2 mins	Wilshire Center - Montebello via 8 <sup>th</sup> Street and Olympic Bl.
Metro	68/84	Local Bus	24 Hours	8 mins	West LA - Montebello via Washington Bl. and Cesar Chavez Av.
LADOT	Dash Boyle Heights/East LA	Dash	7AM-7PM	20 mins	Herbert & Whittier via Wabash, Gage Av. and Rowan

**Table 4-2. Bus Routes Paralleling the Existing Gold Line to East Los Angeles Service**

Operator	Line	Mode	Weekday Hours of Operation	Peak Hour Frequency	Route Description
Montebello	40	Local Bus	5AM-10PM	8 mins	Montebello and Whittier via Beverly Bl.
Montebello	341	Limited Stop Bus	7AM-9AM 4PM-6PM	30 mins	Montebello and Whittier via Beverly Bl.
Montebello	342	Limited Stop Bus	7AM & 5PM	One Trip	Montebello and Whittier via Beverly Bl.
Montebello	343	Limited Stop Bus	7AM-8AM 5PM-6PM	30 mins	Montebello and Whittier via Beverly Bl.

Tables 4-3 and 4-4 summarize the bus routes paralleling the existing Blue Line service to Long Beach and the future Exposition Line service to Culver City.

**Table 4-3. Bus Routes Paralleling the Existing Blue Line Service**

Operator	Line	Mode	Weekday Hours of Operation	Peak Hour Frequency	Route Description
Metro	48	Local Bus	5AM-11PM	7 mins	Avalon Green Line via Main Street and S. San Pedro Street
Metro	60	Local Bus	24 Hours	6 mins	Artesia Blue Line via Long Beach Bl.
Metro	760	Rapid Bus	5AM-8PM	8 mins	Long Beach Bl. Rapid Bus
Metro	445	Freeway Express Bus	5AM-7PM	30 mins	San Pedro via Harbor Transitway, 1 <sup>st</sup> Street and Pacific Av.
Metro	446/447	Freeway Express Bus	5AM-12AM	15 mins	San Pedro via Harbor Transitway, Avalon Bl. and Pacific Av.

**Table 4-4. Bus Routes Paralleling the Future Exposition Line Service**

Operator	Line	Mode	Weekday Hours of Operation	Peak Hour Frequency	Route Description
Metro	4	Local Bus	24 Hours	7 mins	Santa Monica via Santa Monica Blvd.
Metro	10	Local Bus	5AM-12AM	7 mins	West Hollywood via Temple Street and Melrose Avenue
Metro	14	Local Bus	24 Hours	10 mins	Beverly Hills via Beverly Blvd./West LA via Adams Blvd.
Metro	20	Local Bus	24 Hours	4 mins	Santa Monica via Wilshire Blvd.
Metro	26/51/52/352	Local/Limited Stop Bus	24 Hours	4 mins	Hollywood - Compton - Artesia Blue Line via Avalon Blvd.
Metro	28/83/84/328	Local Bus	5AM-1AM	8 mins	Century City via Olympic Blvd.
Metro	33/333	Local/Limited Stop Bus	24 Hours	2 mins	Santa Monica via Venice Blvd.
Metro	35/335	Local/Limited Stop Bus	4AM-12AM	10 mins	West LA via Washington Blvd.
Metro	37	Local Bus	4AM-1AM	10 mins	Beverly Hills via Beverly Blvd./West LA via Adams Blvd.
Metro	90/91	Local Bus	5AM-12AM	10 mins	Sunland via Foothill Blvd., Cañada Blvd., and Glendale Avenue
Metro	439	Freeway Express Bus	5AM-9PM	40-60 mins	Aviation Green Line via Culver City

**Table 4-4. Bus Routes Paralleling the Future Exposition Line Service**

Operator	Line	Mode	Weekday Hours of Operation	Peak Hour Frequency	Route Description
Metro	487	Freeway Express Bus	6AM-9PM	30 mins	Sierra Madre Villa Gold Line via El Monte Busway
Metro	720	Rapid Bus	4AM-1AM	4 mins	Wilshire Blvd. - Whittier Blvd. Rapid
LADOT	CE437	Freeway Express Bus	7AM-9AM 4PM-6PM	15-30 mins	Venice/Marina del Rey/Culver City

## 4.2 Traffic Circulation

### 4.2.1 Roadway Network

The environment in which traffic was evaluated included the north-south major and secondary arterials between and including Arcadia Street and 8<sup>th</sup> Street, and the east-west major and secondary arterials between and including Figueroa Street and Alameda Street. This section describes the major arterials in the project area roadway network.

*Figueroa Street* – This is a major class II arterial according to City of Los Angeles General Plan, and is oriented in a north-south direction. It is a one-way northbound street south of 3<sup>rd</sup> Street and a two-way street north of 3<sup>rd</sup> Street. Figueroa Street currently carries about 19,300 to 32,100 vehicles per day (vpd).

*Flower Street* – This is a secondary roadway according to City of Los Angeles General Plan, and is oriented in a north-south direction. It is a one-way southbound street south of 4<sup>th</sup> Street and a two-way street north of 4<sup>th</sup> Street. The 7<sup>th</sup> Street/Metro Center Station is located at Flower and 7<sup>th</sup> Street. This roadway currently carries from 6,700 to 17,600 vehicles per day.

*Grand Avenue* – This is a major class II arterial according to City of Los Angeles General Plan, and is oriented in a north-south direction. It is a one-way southbound street south of 5<sup>th</sup> Street and a two-way street north of 5<sup>th</sup> Street. It currently carries about 12,300 to 22,500 vehicles per day.

*Olive Street* – This is a secondary roadway according to City of Los Angeles General Plan, and is oriented in a north-south direction. It is a one-way northbound street south of 5<sup>th</sup> Street and a two-way street north of 5<sup>th</sup> Street. It carries about 13,300 to 17,300 vehicles per day.

*Main Street* – This is a secondary roadway according to City of Los Angeles General Plan, and is oriented in a north-south direction. It is a one-way street running north in the project area and carries 11,000 to 12,200 vehicles per day.

*Los Angeles Street* – This is a secondary roadway according to City of Los Angeles General Plan, and is oriented in a north-south direction. It is a two-way street carrying 9,000 to 20,700 vehicles per day.

*Alameda Street* – This is a major class II arterial according to City of Los Angeles General Plan, and is oriented in a north-south direction. It is a two-way street carrying 26,800 to 34,000 vehicles per day.

*Temple Street* – This is a major class II arterial according to City of Los Angeles General Plan, and is oriented in an east-west direction. It is a two-way street carrying 15,100 to 21,700 vehicles per day.

*7<sup>th</sup> Street* – This is a secondary arterial according to City of Los Angeles General Plan, and is oriented in an east-west direction. It is a two-way street carrying 14,000 to 23,300 vehicles per day.

*2<sup>nd</sup> Street* – This is a secondary arterial according to City of Los Angeles General Plan, and is oriented in an east-west direction. It is a two-way street carrying 11,700 to 17,100 vehicles per day.

*3<sup>rd</sup> Street* – This is a secondary arterial according to City of Los Angeles General Plan, and is oriented in an east-west direction. It is a one-way westbound street east of Flower Street and a two-way street west of Flower Street. It carries about 17,800 to 20,800 vehicles per day.

*5<sup>th</sup> Street* – This is a secondary arterial according to City of Los Angeles General Plan, and is oriented in an east-west direction. It is a one-way westbound street and carries about 21,200 to 22,200 vehicles per day.

*7<sup>th</sup> Street* – This is a secondary arterial according to City of Los Angeles General Plan, and is oriented in an east-west direction. It is a two-way street carrying 16,700 to 19,700 vehicles per day.

## 4.2.2 Traffic Count Locations

Traffic counts were conducted to determine existing traffic operating conditions in the project area and develop future traffic projections for the 2035 horizon year analysis. Twenty four-hour tube counts were taken at 66 roadway segments and AM and PM peak period manual turning movement counts were conducted at 85 intersections. The roadway segment analysis was performed using average daily traffic (ADT) volumes taken from the tube counts and compared to the roadway capacity based on the City's General Plan designations. The intersection analysis was performed using the Synchro software to develop AM and PM peak hour operating conditions. Data collection was conducted on representative weekdays (Tuesday, Wednesday, or Thursday) between April and May 2009.

## 4.2.3 Existing (2009) Roadway Segment Operating Conditions

In April and May of 2009, daily 24-hour machine counts were collected at 66 roadway segment locations along 13 streets within the downtown Los Angeles area. Each roadway segment was analyzed to determine daily traffic operations and level of service. Table 4-5 presents capacities, volumes, volume-to-capacity ratios and corresponding levels of service for each roadway segment location analyzed in the project area.

According to the analysis, two roadway segments experience an existing LOS F traffic operating condition. These segments are located on 3<sup>rd</sup> Street between Hill Street and Broadway, and Broadway and Spring Street. One roadway segment, Alameda Street between Temple Street and 1<sup>st</sup> Street, currently experiences an LOS E condition. The remaining roadway segments operate at levels of service D or better.

**Table 4-5. Existing Daily Roadway Analysis**

Cross Street (n/o, w/o)	Facility Type	No. of lanes	Volume	Capacity	V/C Ratio	LOS
<b>Figueroa Street</b>						
2 <sup>nd</sup> Street	Major Class II	5	19,300	40,000	0.48	A
3 <sup>rd</sup> Street	Major Class II	6	11,100	48,000	0.23	A
4 <sup>th</sup> Street	Major Class II	7	30,400	59,500	0.51	A
5 <sup>th</sup> Street	Major Class II	5	30,500	42,500	0.72	C
6 <sup>th</sup> Street	Major Class II	5	32,100	42,500	0.76	C

**Table 4-5. Existing Daily Roadway Analysis**

<b>Cross Street (n/o, w/o)</b>	<b>Facility Type</b>	<b>No. of lanes</b>	<b>Volume</b>	<b>Capacity</b>	<b>V/C Ratio</b>	<b>LOS</b>
Wilshire Blvd.	Major Class II	5	31,500	42,500	0.74	C
7 <sup>th</sup> Street	Major Class II	4	25,300	34,000	0.75	C
<b>Flower Street</b>						
3 <sup>rd</sup> Street	Secondary	4	6,700	28,000	0.24	A
5 <sup>th</sup> Street	Secondary	6	15,100	45,000	0.34	A
6 <sup>th</sup> Street	Secondary	4	14,100	30,000	0.47	A
Wilshire Blvd.	Secondary	4	17,600	30,000	0.59	A
7 <sup>th</sup> Street	Secondary	4	17,000	30,000	0.57	A
<b>Grand Avenue</b>						
Temple Street	Major Class II	4	22,500	32,000	0.70	C
1 <sup>st</sup> Street	Major Class II	4	22,100	32,000	0.69	B
2 <sup>nd</sup> Street	Major Class II	4	17,500	32,000	0.55	A
3 <sup>rd</sup> Street	Major Class II	4	13,500	32,000	0.42	A
4 <sup>th</sup> Street	Major Class II	4	12,300	32,000	0.38	A
<b>Olive Street</b>						
6 <sup>th</sup> Street	Secondary	5	17,300	37,500	0.46	A
7 <sup>th</sup> Street	Secondary	4	13,300	28,000	0.47	A
<b>Main Street</b>						
Temple Street	Secondary	4	11,300	28,000	0.40	A
1 <sup>st</sup> Street (1-Way)	Secondary	3	12,200	22,500	0.54	A

**Table 4-5. Existing Daily Roadway Analysis**

<b>Cross Street (n/o, w/o)</b>	<b>Facility Type</b>	<b>No. of lanes</b>	<b>Volume</b>	<b>Capacity</b>	<b>V/C Ratio</b>	<b>LOS</b>
2 <sup>nd</sup> Street (1-Way)	Secondary	3	11,000	22,500	0.49	A
<b>Los Angeles Street</b>						
Arcadia Street	Secondary	4	9,000	28,000	0.32	A
Temple Street	Secondary	5	20,700	35,000	0.59	A
1 <sup>st</sup> Street	Secondary	4	19,000	28,000	0.68	B
2 <sup>nd</sup> Street	Secondary	4	19,600	28,000	0.70	C
<b>Alameda Street</b>						
Arcadia Street	Major Class II	6	27,700	48,000	0.58	A
Temple Street	Major Class II	5	34,000	40,000	0.85	D
1 <sup>st</sup> Street	Major Class II	4	29,000	32,000	0.91	E
2 <sup>nd</sup> Street	Major Class II	4	27,200	32,000	0.85	D
3 <sup>rd</sup> Street	Major Class II	5	26,800	40,000	0.67	B
<b>Temple Street</b>						
Alameda Street	Major Class II	3	15,100	24,000	0.63	B
Judge John Aiso Street	Major Class II	4	15,700	32,000	0.49	A
Los Angeles Street	Major Class II	4	16,800	32,000	0.53	A
Main Street	Major Class II	4	15,600	32,000	0.49	A
Spring Street	Major Class II	4	17,100	32,000	0.53	A
Broadway	Major Class II	4	16,000	32,000	0.50	A
Grand Avenue	Major Class II	4	21,700	32,000	0.68	B



**Table 4-5. Existing Daily Roadway Analysis**

Cross Street (n/o, w/o)	Facility Type	No. of lanes	Volume	Capacity	V/C Ratio	LOS
<b>1<sup>st</sup> Street</b>						
Alameda Street	Major Class II	4	14,000	32,000	0.44	A
Central Avenue	Major Class II	4	15,500	32,000	0.49	A
Judge John Aiso Street	Major Class II	5	16,200	40,000	0.41	A
Los Angeles Street	Major Class II	6	17,400	48,000	0.36	A
Main Street	Major Class II	5	17,100	40,000	0.43	A
Spring Street	Major Class II	5	20,000	40,000	0.50	A
Broadway	Major Class II	5	20,900	40,000	0.52	A
Hill Street	Major Class II	5	23,300	40,000	0.58	A
<b>2<sup>nd</sup> Street</b>						
Alameda Street	Secondary	3	12,000	21,000	0.57	A
Central Avenue	Secondary	2	11,700	14,000	0.84	D
San Pedro Street	Secondary	2	12,500	14,000	0.89	D
Los Angeles Street	Secondary	3	11,800	21,000	0.56	A
Main Street	Secondary	3	12,200	21,000	0.58	A
Spring Street	Secondary	4	13,600	28,000	0.49	A
Broadway	Secondary	3	14,200	21,000	0.68	B
Figueroa Street	Major Class II	4	17,100	32,000	0.53	A
<b>3<sup>rd</sup> Street</b>						
Alameda Street	Secondary	4	19,900	30,000	0.66	B

**Table 4-5. Existing Daily Roadway Analysis**

Cross Street (n/o, w/o)	Facility Type	No. of lanes	Volume	Capacity	V/C Ratio	LOS
Central Avenue	Secondary	4	19,500	30,000	0.65	B
San Pedro Street	Secondary	4	17,800	30,000	0.59	A
Los Angeles Street	Secondary	3	18,700	22,500	0.83	D
Main Street	Secondary	3	18,800	22,500	0.84	D
Spring Street	Secondary	2	19,200	15,000	1.28	F
Broadway	Secondary	2	19,700	15,000	1.31	F
Flower Street	Secondary	4	20,800	30,000	0.69	B
<b>5<sup>th</sup> Street</b>						
Grand Avenue	Secondary	5	21,200	37,500	0.57	A
Flower Street	Secondary	6	22,200	45,000	0.49	A
<b>7<sup>th</sup> Street</b>						
Grand Avenue	Secondary	4	16,700	28,000	0.60	A
Flower Street	Secondary	5	19,700	35,000	0.56	A

#### 4.2.4 Existing (2009) Intersection Peak Hour Traffic Conditions

Turning movement counts were collected at 85 intersection locations in the Regional Connector project area in order to assess current peak hour traffic operating conditions. The selected intersections are located both along the proposed LRT alignment and along adjacent streets, where potential shifts in traffic patterns may take place due to the proposed project. All intersections are currently signalized except for the 1<sup>st</sup> Street and Dewap Street intersection. All traffic count data were taken on a representative weekday (Tuesday, Wednesday, or Thursday) when schools were in session, there was no public holiday, and there were no unusual or adverse weather conditions.

Each study intersection was analyzed to determine peak hour operations and level of service. The project area roadway network was developed using the Synchro version 7.0 software after physical and operational characteristics for each study intersection was input. The Synchro output provides the level of service for signalized and un-signalized intersections along with an associated overall average vehicle delay in seconds per vehicle.

The existing conditions intersection analysis shows that only the Figueroa Street and Wilshire Boulevard intersection is operating at LOS F in the PM peak hour. All other intersections currently operate at LOS D or better during both the AM and PM peak hours. The results of the existing AM and PM LOS analysis and delay at each of the study intersections are presented in Table 4-6.

Table 4-6. Existing Intersection Level of Service (LOS) Analysis					
No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
1	Grand Avenue / 1 <sup>st</sup> Street	C	24.9	C	27.6
2	Hill Street / 1 <sup>st</sup> Street	B	16.6	C	27.8
3	Broadway / 1 <sup>st</sup> Street	B	15.3	B	16.1
4	Spring Street / 1 <sup>st</sup> Street	B	14.2	B	11.5
5	Main Street / 1 <sup>st</sup> Street	B	11.7	C	21.4
6	Los Angeles Street / 1 <sup>st</sup> Street	B	11.7	B	17.6
7	Judge John Aiso Street / 1 <sup>st</sup> Street	A	8.8	B	13.6
8	Central Avenue / 1 <sup>st</sup> Street	A	5.5	A	8.8
9	Alameda Street / 1 <sup>st</sup> Street	B	17.1	C	28.8
10	Figueroa Street / 2 <sup>nd</sup> Street	B	19.8	C	30.4
11	Grand Avenue / 2 <sup>nd</sup> Street	B	10.3	B	13.1
12	Hill Street / 2 <sup>nd</sup> Street	B	13.5	B	11.8
13	Broadway / 2 <sup>nd</sup> Street	B	14.5	B	15.5

**Table 4-6. Existing Intersection Level of Service (LOS) Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
14	Spring Street / 2 <sup>nd</sup> Street	B	15.3	B	12.0
15	Main Street / 2 <sup>nd</sup> Street	B	10.4	B	16.8
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	11.4	B	18.5
17	San Pedro Street / 2 <sup>nd</sup> Street	B	11.3	B	13.6
18	Central Avenue / 2 <sup>nd</sup> Street	A	7.4	A	8.3
19	Alameda Street / 2 <sup>nd</sup> Street	B	10.2	B	13.8
20	Figueroa Street / 3 <sup>rd</sup> Street	C	27.9	D	45.0
21	Flower Street / 3 <sup>rd</sup> Street	B	19.3	B	10.4
22	Grand Avenue / 3 <sup>rd</sup> Street	A	6.7	A	9.8
23	Hill Street / 3 <sup>rd</sup> Street	B	18.3	B	18.7
24	Broadway / 3 <sup>rd</sup> Street	C	23.9	B	18.1
25	Spring Street / 3 <sup>rd</sup> Street	C	22.3	B	13.7
26	Main Street / 3 <sup>rd</sup> Street	B	13.6	B	15.7
27	Los Angeles Street / 3 <sup>rd</sup> Street	B	14.2	B	15.1
28	San Pedro Street / 3 <sup>rd</sup> Street	A	10.0	A	9.0
29	Central Avenue / 3 <sup>rd</sup> Street	B	12.1	B	11.5
30	Alameda Street / 3 <sup>rd</sup> Street	C	21.6	B	12.9
31	Figueroa Street / 4 <sup>th</sup> Street	B	13.2	B	13.3
32	Flower Street / 4 <sup>th</sup> Street	C	20.3	D	44.6
33	Grand Avenue / 4 <sup>th</sup> Street	A	2.7	A	4.4

**Table 4-6. Existing Intersection Level of Service (LOS) Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
34	Figueroa Street / 5 <sup>th</sup> Street	B	12.8	C	25.4
35	Flower Street / 5 <sup>th</sup> Street	B	13.9	B	16.6
36	Grand Avenue / 5 <sup>th</sup> Street	B	14.7	C	24.3
37	Olive Street / 5 <sup>th</sup> Street	B	15.4	B	17.7
38	Figueroa Street / 6 <sup>th</sup> Street	C	30.8	D	43.6
39	Flower Street / 6 <sup>th</sup> Street	B	14.8	B	19.0
40	Hope Street / 6 <sup>th</sup> Street	A	6.0	B	10.7
41	Grand Avenue / 6 <sup>th</sup> Street	B	13.0	B	15.2
42	Olive Street / 6 <sup>th</sup> Street	B	12.6	C	20.0
43	Figueroa Street / Wilshire Blvd.	C	21.3	F	117.1
44	Flower Street / Wilshire Blvd.	B	14.5	C	22.4
45	Figueroa Street / 7 <sup>th</sup> Street	B	19.3	C	27.4
46	Flower Street / 7 <sup>th</sup> Street	A	8.9	B	19.8
47	Hope Street / 7 <sup>th</sup> Street	A	7.7	B	10.5
48	Grand Avenue / 7 <sup>th</sup> Street	B	12.9	B	17.9
49	Olive Street / 7 <sup>th</sup> Street	B	12.0	B	16.1
50	Figueroa Street / 8 <sup>th</sup> Street	B	13.5	C	20.5
51	Flower Street / 8 <sup>th</sup> Street	A	9.4	B	18.8
52	Hope Street / Temple Street	C	23.6	C	30.6
53	Grand Avenue / Temple Street	C	29.8	D	38.4

**Table 4-6. Existing Intersection Level of Service (LOS) Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
54	Hill Street / Temple Street	B	17.6	C	33.1
55	Broadway / Temple Street	C	20.3	C	21.8
56	Spring Street / Temple Street	B	14.5	B	12.8
57	Main Street / Temple Street	A	8.8	B	19.5
58	Los Angeles Street / Temple Street	B	12.5	B	14.7
59	Judge John Aiso Street / Temple Street	A	7.5	A	9.7
60	Alameda Street / Temple Street	C	22.8	C	34.4
61	Los Angeles Street / Aliso Street	B	11.1	B	15.8
62	Alameda Street / Aliso Street	C	20.1	C	24.0
63	Los Angeles Street / Arcadia Street	B	11.7	B	12.3
64	Alameda Street / Arcadia Street	C	22.9	B	15.8
65-1	Alameda Street / N. Los Angeles Street	B	13.3	B	10.5
65-2	Alameda Street / S. Los Angeles Street	A	4.4	B	10.6
66	Dewap Rd. / 1 <sup>st</sup> Street	A	2.7	B	12.1
67	Olive Street / 1 <sup>st</sup> Street	B	11.7	B	17.8
68	Hope Street / 1 <sup>st</sup> Street	D	35.8	C	25.6
69	S. Hope Street / 2 <sup>nd</sup> Street	A	7.0	B	12.2
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	B	15.1	B	17.7
71	Broadway / Arcadia Street	A	9.7	B	12.6
72	Spring Street / Arcadia Street	B	12.5	A	9.0

**Table 4-6. Existing Intersection Level of Service (LOS) Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
73	Main Street / Arcadia Street	A	8.1	B	11.3
74	Broadway / Aliso Street	B	12.8	B	11.5
75	Spring Street / Aliso Street	A	9.1	A	9.7
76	Main Street / Aliso Street	A	5.9	B	11.6
77	Hill Street / 4 <sup>th</sup> Street	B	11.5	B	17.0
78	Olive Street / 4 <sup>th</sup> Street	B	14.2	C	24.2
79	Broadway / 4 <sup>th</sup> Street	A	9.1	B	15.0
80	Spring Street / 4 <sup>th</sup> Street	A	9.9	B	14.9
81	Main Street / 4 <sup>th</sup> Street	A	7.2	C	20.3
82	Los Angeles Street / 4 <sup>th</sup> Street	A	7.9	B	19.2
83	San Pedro Street / 4 <sup>th</sup> Street	A	6.3	B	11.4
84	Central Avenue / 4 <sup>th</sup> Street	A	7.3	B	14.3
85	Alameda Street / 4 <sup>th</sup> Street	A	8.3	C	32.2

### 4.3 Parking

A comprehensive field survey was performed to collect the number of on-street parking spaces, loading spaces, and driveways that may be affected due to the proposed Regional Connector project. The street segments within each proposed alignment were surveyed to identify the existing number of parking spaces and associated peak period parking restriction information. Along the alignments, parking regulations permit a number of on-street parking spaces in one or both directions during the AM and PM peak hours. Current on-street parking, loading, and driveway information are summarized in Table 4-7.

## 4.4 Other Modes

Depending on the alternative being considered, areas that may have potential impacts on pedestrians and bicyclists include streets and intersections where the proposed LRT has an at-grade profile. These areas include Flower Street between 4<sup>th</sup> and 3<sup>rd</sup> Streets, 2<sup>nd</sup> Street between Hill and Los Angeles Streets, Main and Los Angeles Streets between Temple and 2<sup>nd</sup> Streets, Temple Street between Main and Alameda Streets, and Alameda Street between Aliso and 2<sup>nd</sup> Streets.



**Table 4-7. Existing Parking Information**

Roadway Segment	East/North Side			West/South Side		
	Parking Spaces	Loading Spaces	Driveways	Parking Spaces	Loading Spaces	Driveways
<b>Flower Street</b>						
8 <sup>th</sup> Street to 7 <sup>th</sup> Street	14	2	1	8	0	3
7 <sup>th</sup> Street to Wilshire Blvd.	0	1	2	0	0	1
Wilshire Blvd. to 6 <sup>th</sup> Street	4	4	0	0	0	1
6 <sup>th</sup> Street to 5 <sup>th</sup> Street	0	0	3	0	4	2
5 <sup>th</sup> Street to 4 <sup>th</sup> Street	13	0	3	0	6	2
4 <sup>th</sup> Street to 3 <sup>rd</sup> Street	0	5	1	5	0	3
<b>2<sup>nd</sup> Street</b>						
Hill Street to Broadway	0	0	0	9	1	0
Broadway to Spring Street	0	0	1	0	0	2
Spring Street to Main Street	0	0	0	6	4	1
Main Street to Los Angeles Street	0	0	0	8	0	1
Los Angeles Street to Judge John Aiso Street	6	0	3	0	0	1

**Table 4-7. Existing Parking Information**

Roadway Segment	East/North Side			West/South Side		
	Parking Spaces	Loading Spaces	Driveways	Parking Spaces	Loading Spaces	Driveways
Judge John Aiso Street to Central Avenue	18	5	1	20	1	2
Central Avenue to Alameda Street	4	0	2	4	0	1
<b>Hope Street</b>						
3 <sup>rd</sup> Street to Gen. Thaddeus Kosciuszko Way	3	0	2	9	0	0
Gen. Thaddeus Kosciuszko Way to 2 <sup>nd</sup> Street	0	0	1	0	0	0
<b>Main Street</b>						
2 <sup>nd</sup> Street to 1 <sup>st</sup> Street	0	4	2	0	0	1
1 <sup>st</sup> Street to Temple Street	0	7	0	0	6	2
<b>Los Angeles Street</b>						
2 <sup>nd</sup> Street to 1 <sup>st</sup> Street	0	10	1	0	4	2
1 <sup>st</sup> Street to Temple Street	0	0	1	0	7	1
<b>Temple Street</b>						

**Table 4-7. Existing Parking Information**

Roadway Segment	East/North Side			West/South Side		
	Parking Spaces	Loading Spaces	Driveways	Parking Spaces	Loading Spaces	Driveways
Main Street to Los Angeles Street	4	0	0	0	0	0
Los Angeles Street to Judge John Aiso Street	0	0	0	0	0	3
Judge John Aiso Street to Alameda Street	0	4	1	12	0	1
<b>Alameda Street</b>						
2 <sup>nd</sup> Street to 1 <sup>st</sup> Street	10	0	1	0	0	2
1 <sup>st</sup> Street to Temple Street	0	0	0	0	3	1
Temple Street to Aliso Street	0	0	0	0	0	1

#### 4.4.1 Pedestrians

In urban settings, sidewalks are recommended to be 6 to 9.8 feet wide. The space closest to the curb allows for a buffer against moving traffic as well as space for street hardware, including light poles and street signs. The City of Los Angeles' guidelines recommend secondary arterial sidewalk widths of between 9 and 10.7 feet. In addition, all of the signalized intersections along the proposed LRT alignments currently have pedestrian call buttons. Crossing tracks at uncontrolled locations is prohibited and signs are placed to guide pedestrians to the nearest safe crossing at a signalized crosswalk location.

#### 4.4.2 Bicycles

The Metro bicycle plan has designated 1<sup>st</sup> Street as a future Commuter Bikeway. This is defined as a hybrid of a Class II and Class III bikeway. Class II bikeways are designated striped lanes on surface streets, and Class III bikeways are unstriped bike routes that are designated by green "bike route" signage. Commuter Bikeways are unstriped routes that utilize a wide curb lane where parking is prohibited during peak hours. On 1<sup>st</sup> Street, the Commuter Bikeway would utilize the curb lane during peak periods when parking is prohibited. During off-peak hours, bicyclists ride in the traffic stream to avoid opening car doors.

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## 5.0 IMPACTS

This section identifies operational and construction effects of the proposed project for each of the alternatives under consideration. The forecasts used to perform the operational analysis account for background growth in traffic due to cumulative projects, additional regional and sub-regional land use development, and population and employment growth.

### 5.1 Operational Impacts

The following sections describe future operational effects and conditions by alternative. The analysis was performed for the horizon year of 2035.

#### 5.1.1 No Build Alternative

##### 5.1.1.1 Transit

By horizon year 2035, several Metro Rail lines will be operating in the region. These transit services are included in the current adopted 2009 Metro Long Range Transportation Plan. As a result of the new rail lines, some bus services would be reorganized to minimize duplication of services. The Metro Corridors Base Model that was used to develop the travel demand forecasts takes these service changes into consideration. It also includes changes such as service cancellations based on the performance index, reducing service duplication by restructuring and truncating bus lines, and providing an efficient operational mix between Rapid and local bus service.

Transit service under the No Build Alternative would be focused on preserving existing services and projects. By horizon year 2035, the Metro Exposition Line to Santa Monica would be in service and some bus line service would have been reorganized and restructured to provide connections with the new rail lines. Otherwise, the transit network within the project area would be largely the same as it is now. The total daily system wide linked trips for the entire bus and rail system is projected to be about 1,717,100. A linked trip consists of one person making a one-way trip, which may include the use of multiple transit vehicles on the transit system. The daily urban rail boardings for this alternative would be 258,500 at the Metro Blue Line, Metro Gold Line, and Metro Expo Line stations combined. A single boarding is defined as one person getting on one transit vehicle. Consequently, a linked trip can be comprised of multiple boardings.

It is anticipated that the current bus service would predominantly remain the same through the year 2035 under the No Build Alternative in the project area. There would be increased headways for some of the heavily travelled lines. In addition, increases along the lines listed in Tables 4-1 through 4-4 would help feed more passengers into the downtown area and into the project area.

Transit patrons would continue to transfer twice to the Metro Red and Purple Lines through downtown to make a complete east-west or north-south trip. It is expected that transit service performance through the downtown area would likely decrease due to increased traffic congestion. This may make travel via transit a less attractive option for patrons traveling across downtown between Santa Monica and the I-605 vicinity or from Azusa to Long Beach. For those transit patrons that have no other travel options, travel times would increase and transit usage would be less convenient. As a result, without significant improvements in transit service under the No Build Alternative, there would be a negative impact upon those that rely on the public transit system for east-west and north-south travel through the downtown area.

#### 5.1.1.2 Traffic Circulation

Traffic forecasts were developed for horizon year 2035 by obtaining the Metro model projections for the no build condition and post-processing the information to reflect the anticipated growth within the project area. The resulting forecasts for the No Build Alternative account for background growth in traffic due to additional regional and sub-regional land use development (cumulative projects) and population growth. Using these year 2035 forecasts, an operational analysis was performed for the No Build Alternative. Based on the post-processed results of the long-range traffic projections, the growth factors at the 85 study intersections ranged from 1.30 to 1.57 over a 26-year period. This equates to a compounded average annual growth rate of 1 to 1.75 percent.

Future no build conditions (without the LRT) were analyzed; resulting traffic operating conditions and corresponding morning and afternoon peak hour LOS are presented in Table 5-1. This analysis assumed no improvements to the existing roadway system and the existing intersection lane configurations.

The results indicate that under no build conditions, 71 intersections would continue to operate at LOS D or better in the AM peak hour and 57 would continue to operate at LOS D or better in the PM peak hour. In the AM peak hour, six intersections would operate at LOS E and eight would operate at LOS F. In the PM peak hour, these numbers increase to 13 intersections operating at LOS E and 15 operating at LOS F. Intersections operating at LOS E or F are shown in bold.

#### 5.1.1.3 Parking

The No Build Alternative would have no impact on the number of on-street parking and loading spaces in the project area. However, by 2035 increased growth in the area will lead to increased parking demand on the already strained parking resources. This may lead to increased and costly parking requirements for new developments in the area, potential changes in land-use choices that are not consistent with neighborhoods or communities in the project area, or increased parking prices to quell demand.

### 5.1.1.4 Other Modes

The No Build Alternative would have no impacts on bicycle or pedestrian facilities within the project area. However, increased traffic congestion and deterioration of LOS for traffic segments and intersections would result in performance deterioration of bicycle and pedestrians movements along the project corridor.

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
1	Grand Avenue / 1 <sup>st</sup> Street	E	65.3	E	56.2
2	Hill Street / 1 <sup>st</sup> Street	C	24.1	E	67.2
3	Broadway / 1 <sup>st</sup> Street	C	24.0	C	30.5
4	Spring Street / 1 <sup>st</sup> Street	B	17.3	B	15.7
5	Main Street / 1 <sup>st</sup> Street	B	16.5	D	53.0
6	Los Angeles Street / 1 <sup>st</sup> Street	B	16.6	F	102.9
7	Judge John Aiso Street / 1 <sup>st</sup> Street	B	13.9	C	21.1
8	Central Avenue / 1 <sup>st</sup> Street	A	5.8	B	14.1
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	F	97.6
10	Figueroa Street / 2 <sup>nd</sup> Street	C	25.8	F	120.7
11	Grand Avenue / 2 <sup>nd</sup> Street	B	13.6	B	16.7
12	Hill Street / 2 <sup>nd</sup> Street	B	19.7	B	19.9
13	Broadway / 2 <sup>nd</sup> Street	B	18.4	C	20.6
14	Spring Street / 2 <sup>nd</sup> Street	C	25.3	B	14.5
15	Main Street / 2 <sup>nd</sup> Street	B	12.9	C	33.9
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	14.8	C	34.4

**Table 5-1. 2035 No Build Alternative: Intersection Level of Service Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
17	San Pedro Street / 2 <sup>nd</sup> Street	B	14.5	B	19.1
18	Central Avenue / 2 <sup>nd</sup> Street	A	9.9	B	10.2
19	Alameda Street / 2 <sup>nd</sup> Street	B	15.9	C	33.1
20	Figueroa Street / 3 <sup>rd</sup> Street	F	<b>98.5</b>	F	<b>140.9</b>
21	Flower Street / 3 <sup>rd</sup> Street	C	28.4	B	15.7
22	Grand Avenue / 3 <sup>rd</sup> Street	A	9.6	B	13.3
23	Hill Street / 3 <sup>rd</sup> Street	E	<b>58.7</b>	D	48.5
24	Broadway / 3 <sup>rd</sup> Street	F	<b>86.9</b>	E	<b>65.7</b>
25	Spring Street / 3 <sup>rd</sup> Street	F	<b>87.8</b>	E	<b>55.9</b>
26	Main Street / 3 <sup>rd</sup> Street	C	22.7	D	39.1
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	<b>67.1</b>	C	23.9
28	San Pedro Street / 3 <sup>rd</sup> Street	C	23.7	B	13.9
29	Central Avenue / 3 <sup>rd</sup> Street	C	25.2	B	15.3
30	Alameda Street / 3 <sup>rd</sup> Street	F	<b>82.9</b>	E	<b>57.1</b>
31	Figueroa Street / 4 <sup>th</sup> Street	B	18.0	B	19.4
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	F	<b>91.5</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	3.0	A	4.6
34	Figueroa Street / 5 <sup>th</sup> Street	B	16.5	E	<b>71.6</b>
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	20.8
36	Grand Avenue / 5 <sup>th</sup> Street	C	21.8	E	<b>58.5</b>



**Table 5-1. 2035 No Build Alternative: Intersection Level of Service Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
37	Olive Street / 5 <sup>th</sup> Street	C	20.8	E	61.6
38	Figueroa Street / 6 <sup>th</sup> Street	F	104.0	F	98.4
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	C	31.9
40	Hope Street / 6 <sup>th</sup> Street	A	7.3	B	16.2
41	Grand Avenue / 6 <sup>th</sup> Street	B	16.4	C	22.3
42	Olive Street / 6 <sup>th</sup> Street	B	18.8	C	31.8
43	Figueroa Street / Wilshire Blvd.	E	61.6	F	206.8
44	Flower Street / Wilshire Blvd.	D	41.0	D	44.2
45	Figueroa Street / 7 <sup>th</sup> Street	C	24.8	D	51.4
46	Flower Street / 7 <sup>th</sup> Street	B	13.8	F	131.6
47	Hope Street / 7 <sup>th</sup> Street	B	10.7	B	16.3
48	Grand Avenue / 7 <sup>th</sup> Street	B	16.4	C	29.0
49	Olive Street / 7 <sup>th</sup> Street	B	16.2	C	20.6
50	Figueroa Street / 8 <sup>th</sup> Street	B	16.6	F	94.2
51	Flower Street / 8 <sup>th</sup> Street	B	13.9	F	91.8
52	Hope Street / Temple Street	D	36.5	E	60.2
53	Grand Avenue / Temple Street	F	94.4	F	106.6
54	Hill Street / Temple Street	D	35.2	F	95.1
55	Broadway / Temple Street	E	70.1	E	69.1
56	Spring Street / Temple Street	C	27.5	B	18.6

**Table 5-1. 2035 No Build Alternative: Intersection Level of Service Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
57	Main Street / Temple Street	B	11.4	C	30.2
58	Los Angeles Street / Temple Street	B	19.7	C	32.7
59	Judge John Aiso Street / Temple Street	A	5.6	B	15.7
60	Alameda Street / Temple Street	C	29.9	E	77.1
61	Los Angeles Street / Aliso Street	B	12.9	C	21.7
62	Alameda Street / Aliso Street	F	88.5	D	48.9
63	Los Angeles Street / Arcadia Street	B	14.4	B	16.3
64	Alameda Street / Arcadia Street	E	64.7	F	148.5
65-1	Alameda Street / Los Angeles Street N.	D	40.4	C	26.2
65-2	Alameda Street / Los Angeles Street S.	A	6.5	B	15.4
66	Dewap Rd. / 1 <sup>st</sup> Street	A	5.7	F	75.4
67	Olive Street / 1 <sup>st</sup> Street	B	16.1	C	25.1
68	Hope Street / 1 <sup>st</sup> Street	F	99.7	E	57.8
69	S. Hope Street / 2 <sup>nd</sup> Street	A	7.5	C	32.0
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	B	18.2	C	24.3
71	Broadway / Arcadia Street	B	12.8	D	45.2
72	Spring Street / Arcadia Street	B	16.3	B	10.4
73	Main Street / Arcadia Street	A	9.4	B	15.6
74	Broadway / Aliso Street	B	19.6	C	21.9
75	Spring Street / Aliso Street	B	11.4	B	11.1

**Table 5-1. 2035 No Build Alternative: Intersection Level of Service Analysis**

No.	Intersection	AM		PM	
		LOS	Delay	LOS	Delay
76	Main Street / Aliso Street	A	6.8	B	16.5
77	Hill Street / 4 <sup>th</sup> Street	B	18.3	D	45.4
78	Olive Street / 4 <sup>th</sup> Street	B	17.0	<b>E</b>	<b>61.5</b>
79	Broadway / 4 <sup>th</sup> Street	B	14.8	C	22.1
80	Spring Street / 4 <sup>th</sup> Street	B	13.9	C	21.4
81	Main Street / 4 <sup>th</sup> Street	B	11.8	C	34.7
82	Los Angeles Street / 4 <sup>th</sup> Street	B	10.6	C	33.1
83	San Pedro Street / 4 <sup>th</sup> Street	A	8.1	B	19.9
84	Central Avenue / 4 <sup>th</sup> Street	A	8.2	B	19.6
85	Alameda Street / 4 <sup>th</sup> Street	B	12.0	<b>F</b>	<b>131.1</b>

## 5.1.2 Transportation System Management (TSM) Alternative

### 5.1.2.1 Transit

The TSM Alternative proposes two express shuttle bus routes instead of light rail as a link between the 7<sup>th</sup> Street/Metro Center Station and Union Station. All provisions of the No Build Alternative would also be included.

The proposed shuttle buses would run every 2.5 minutes during peak hours and every 5 minutes during off-peak hours to move passengers efficiently between the two stations. They may have traffic signal priority similar to the Metro Rapid system, where the traffic signal control system grants longer green lights to oncoming transit vehicles, to improve bus speeds. Enhanced bus stops would be located every two to three blocks to maximize coverage of the area surrounding the routes. These shuttle routes would be operated by Metro.

For the TSM Alternative, the total daily system wide linked trips for the entire bus and rail system is projected to be about 1,722,400, which is a 5,300-trip increase over the No Build Alternative. A linked trip consists of one person making a one-way trip, which may include the use of multiple transit vehicles on the transit system. The daily urban rail boardings for this alternative is projected to be 258,000 at the Metro Blue Line, Metro Gold Line, and Metro Expo Line stations combined.

The TSM Alternative would improve the east-west and north-south connections between the stations, although transit patrons would still be required to transfer through downtown in order to make a complete trip.

This may make travel via transit a less attractive option for patrons traveling across downtown between Santa Monica and the I-605 vicinity or from Azusa to Long Beach. For those transit patrons that have no other travel options, travel times would increase and transit usage would be less convenient than projected under one of the LRT alternatives. As a result, there would be a negative impact upon those that rely on the public transit system for east-west and north-south travel through the downtown area.

Projections show a similar number of urban rail boardings as the No Build Alternative; however, the proposed shuttle bus service is projected to carry 42,700 daily boardings. It is expected that the theoretical carrying capacity would be approximately 3,400 passengers per hour in each direction using 30-foot shuttle buses; though 40-foot shuttle buses could also be used. This alternative would still result in a negative impact on transit-dependent users, though it would be a marginal improvement over the No Build Alternative.

The transit impacts identified under this alternative would be less than significant.

#### **5.1.2.2 Traffic Circulation**

The TSM Alternative would add two new express shuttle bus lines linking the 7<sup>th</sup> Street/Metro Center Station and Union Station. These buses would run frequently, operating at 2.5-minute headways during the AM and PM peak hours and every five minutes during the off-peak hours. The number of buses operating during the peak hour for each route was added to the no build traffic volume information of the affected intersections to yield a set of year 2035 intersection forecasts for the TSM Alternative. Intersection lane configurations for this alternative were assumed to be the same as for the No Build Alternative.

The results of the traffic analysis and corresponding AM and PM peak hour levels of service for this alternative are shown in Table 5-2. The table highlights in bold the intersections that exceed the significance threshold and are expected to be significantly impacted due to TSM Alternative.

The results indicate that under the TSM Alternative, 71 intersections would continue to operate at LOS D or better in the AM peak hour and 57 would continue to operate at LOS D or better in the PM peak hour. During the AM peak hour, six intersections would operate at LOS E and eight would operate at LOS F. In the PM peak hour, these numbers would increase to 12 intersections operating at LOS E and 16 operating at LOS F. Many of these intersections would operate at the same level of service as projected for the No Build Alternative.

Intersections that are considered to be impacted are those that have a significant negative change in LOS when compared to the No Build Alternative conditions. As defined in Section 3.1, the significance of an impact is related to the magnitude in the change in delay. Eight intersections would be impacted during the AM peak hour and nine intersections would be impacted during the PM peak hour. These impacts would be significant adverse effects of the TSM Alternative.

The traffic circulation impacts identified under this alternative would be significant.

Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts							
No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	65.3	E	68.8	3.5	Yes
2	Hill Street / 1 <sup>st</sup> Street	C	24.1	C	24.1	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	24.0	C	24.0	0.0	No
4	Spring Street / 1 <sup>st</sup> Street	B	17.3	B	17.3	0.0	No
5	Main Street / 1 <sup>st</sup> Street	B	16.5	B	16.5	0.0	No
6	Los Angeles Street / 1 <sup>st</sup> Street	B	16.6	B	16.6	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	B	13.9	B	13.9	0.0	No
8	Central Avenue / 1 <sup>st</sup> Street	A	5.8	A	5.8	0.0	No
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	D	45.4	1.0	No

**Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
10	Figueroa Street / 2 <sup>nd</sup> Street	C	25.8	C	26.0	0.2	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	13.6	B	13.8	0.2	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.7	C	20.1	0.4	No
13	Broadway / 2 <sup>nd</sup> Street	B	18.4	B	18.6	0.2	No
14	Spring Street / 2 <sup>nd</sup> Street	C	25.3	C	26.6	1.3	No
15	Main Street / 2 <sup>nd</sup> Street	B	12.9	B	13.0	0.1	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	14.8	B	15.3	0.5	No
17	San Pedro Street / 2 <sup>nd</sup> Street	B	14.5	B	14.9	0.4	No
18	Central Avenue / 2 <sup>nd</sup> Street	A	9.9	A	9.9	0.0	No
19	Alameda Street / 2 <sup>nd</sup> Street	B	15.9	B	17.2	1.3	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	98.5	F	98.1	-0.4	No
21	Flower Street / 3 <sup>rd</sup> Street	C	28.4	C	31.2	2.8	No
22	Grand Avenue / 3 <sup>rd</sup> Street	A	9.6	A	9.9	0.3	No
23	Hill Street / 3 <sup>rd</sup> Street	E	58.7	E	61.3	<b>2.6</b>	<b>Yes</b>
24	Broadway / 3 <sup>rd</sup> Street	F	86.9	F	91.2	<b>4.3</b>	<b>Yes</b>
25	Spring Street / 3 <sup>rd</sup> Street	F	87.8	F	92.0	<b>4.2</b>	<b>Yes</b>
26	Main Street / 3 <sup>rd</sup> Street	C	22.7	C	23.5	0.8	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	67.1	E	70.6	<b>3.5</b>	<b>Yes</b>
28	San Pedro Street / 3 <sup>rd</sup> Street	C	23.7	C	24.8	1.1	No
29	Central Avenue / 3 <sup>rd</sup> Street	C	25.2	C	26.6	1.4	No

No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
30	Alameda Street / 3 <sup>rd</sup> Street	F	82.9	F	82.7	-0.2	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	18.0	B	18.1	0.1	No
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	D	40.3	0.7	No
33	Grand Avenue / 4 <sup>th</sup> Street	A	3.0	A	3.0	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	B	16.5	B	16.6	0.1	No
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	24.8	2.5	No
36	Grand Avenue / 5 <sup>th</sup> Street	C	21.8	C	22.7	0.9	No
37	Olive Street / 5 <sup>th</sup> Street	C	20.8	C	20.7	-0.1	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	104.0	F	103.7	-0.3	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	C	33.7	1.1	No
40	Hope Street / 6 <sup>th</sup> Street	A	7.3	A	7.3	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	B	16.4	B	16.4	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	B	18.8	B	19.0	0.2	No
43	Figueroa Street / Wilshire Blvd.	E	61.6	E	64.4	<b>2.8</b>	<b>Yes</b>
44	Flower Street / Wilshire Blvd.	D	41.0	D	41.2	0.2	No
45	Figueroa Street / 7 <sup>th</sup> Street	C	24.8	C	25.1	0.3	No
46	Flower Street / 7 <sup>th</sup> Street	B	13.8	B	13.9	0.1	No
47	Hope Street / 7 <sup>th</sup> Street	B	10.7	B	10.7	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	B	16.4	B	16.3	-0.1	No
49	Olive Street / 7 <sup>th</sup> Street	B	16.2	B	16.5	0.3	No

**Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
50	Figueroa Street / 8 <sup>th</sup> Street	B	16.6	B	16.8	0.2	No
51	Flower Street / 8 <sup>th</sup> Street	B	13.9	B	14.0	0.1	No
52	Hope Street / Temple Street	D	36.5	D	36.5	0.0	No
53	Grand Avenue / Temple Street	F	94.4	F	94.5	0.1	No
54	Hill Street / Temple Street	D	35.2	D	36.6	1.4	No
55	Broadway / Temple Street	E	70.1	E	71.1	1.0	No
56	Spring Street / Temple Street	C	27.5	C	27.8	0.3	No
57	Main Street / Temple Street	B	11.4	B	11.6	0.2	No
58	Los Angeles Street / Temple Street	B	19.7	C	20.5	0.8	No
59	Judge John Aiso Street / Temple Street	A	5.6	A	5.6	0.0	No
60	Alameda Street / Temple Street	C	29.9	C	31.2	1.3	No
61	Los Angeles Street / Aliso Street	B	12.9	B	13.1	0.2	No
62	Alameda Street / Aliso Street	F	88.5	F	99.0	<b>10.5</b>	<b>Yes</b>
63	Los Angeles Street / Arcadia Street	B	14.4	B	14.9	0.5	No
64	Alameda Street / Arcadia Street	E	64.7	E	65.3	0.6	No
65-1	Alameda Street / Los Angeles Street N.	D	40.4	D	47.0	<b>6.6</b>	<b>Yes</b>
65-2	Alameda Street / Los Angeles Street S.	A	6.5	A	7.0	0.5	No



Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts							
No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
66	Dewap Rd. / 1 <sup>st</sup> Street	A	5.7	A	5.7	0.0	No
67	Olive Street / 1 <sup>st</sup> Street	B	16.1	B	16.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	F	99.7	F	99.7	0.0	No
69	S. Hope Street / 2 <sup>nd</sup> Street	A	7.5	A	7.5	0.0	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	B	18.2	B	18.2	0.0	No
71	Broadway / Arcadia Street	B	12.8	B	12.8	0.0	No
72	Spring Street / Arcadia Street	B	16.3	B	16.3	0.0	No
73	Main Street / Arcadia Street	A	9.4	A	9.4	0.0	No
74	Broadway / Aliso Street	B	19.6	B	19.6	0.0	No
75	Spring Street / Aliso Street	B	11.4	B	11.4	0.0	No
76	Main Street / Aliso Street	A	6.8	A	6.8	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	B	18.3	B	18.3	0.0	No
78	Olive Street / 4 <sup>th</sup> Street	B	17.0	B	17.0	0.0	No
79	Broadway / 4 <sup>th</sup> Street	B	14.8	B	14.8	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
81	Main Street / 4 <sup>th</sup> Street	B	11.8	B	11.8	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	B	10.6	B	10.6	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	A	8.1	A	8.1	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	A	8.2	A	8.2	0.0	No

Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts							
No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
85	Alameda Street / 4 <sup>th</sup> Street	B	12.0	B	12.0	0.0	No
<b>PM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	56.2	E	57.5	1.3	No
2	Hill Street / 1 <sup>st</sup> Street	E	67.2	E	67.2	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	30.5	C	30.5	0.0	No
4	Spring Street / 1 <sup>st</sup> Street	B	15.7	B	15.7	0.0	No
5	Main Street / 1 <sup>st</sup> Street	D	53.0	D	53.0	0.0	No
6	Los Angeles Street / 1 <sup>st</sup> Street	F	102.9	F	102.9	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	C	21.1	C	21.1	0.0	No
8	Central Avenue / 1 <sup>st</sup> Street	B	14.1	B	14.1	0.0	No
9	Alameda Street / 1 <sup>st</sup> Street	F	97.6	F	100.8	3.2	Yes
10	Figueroa Street / 2 <sup>nd</sup> Street	F	120.7	F	124.1	3.4	Yes
11	Grand Avenue / 2 <sup>nd</sup> Street	B	16.7	B	16.9	0.2	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.9	C	20.2	0.3	No
13	Broadway / 2 <sup>nd</sup> Street	C	20.6	C	21.1	0.5	No
14	Spring Street / 2 <sup>nd</sup> Street	B	14.5	B	14.7	0.2	No
15	Main Street / 2 <sup>nd</sup> Street	C	33.9	D	35.0	1.1	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	C	34.4	D	36.7	2.3	No
17	San Pedro Street / 2 <sup>nd</sup> Street	B	19.1	B	19.9	0.8	No
18	Central Avenue / 2 <sup>nd</sup> Street	B	10.2	B	10.4	0.2	No

**Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
19	Alameda Street / 2 <sup>nd</sup> Street	C	33.1	D	36.9	3.8	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	140.9	F	143.2	2.3	No
21	Flower Street / 3 <sup>rd</sup> Street	B	15.7	B	15.7	0.0	No
22	Grand Avenue / 3 <sup>rd</sup> Street	B	13.3	B	13.4	0.1	No
23	Hill Street / 3 <sup>rd</sup> Street	D	48.5	D	51.7	3.2	No
24	Broadway / 3 <sup>rd</sup> Street	E	65.7	E	68.3	<b>2.6</b>	<b>Yes</b>
25	Spring Street / 3 <sup>rd</sup> Street	E	55.9	E	59.7	<b>3.8</b>	<b>Yes</b>
26	Main Street / 3 <sup>rd</sup> Street	D	39.1	D	40.1	1.0	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	C	23.9	C	24.2	0.3	No
28	San Pedro Street / 3 <sup>rd</sup> Street	B	13.9	B	14.0	0.1	No
29	Central Avenue / 3 <sup>rd</sup> Street	B	15.3	B	15.5	0.2	No
30	Alameda Street / 3 <sup>rd</sup> Street	E	57.1	E	56.9	-0.2	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	19.4	B	19.7	0.3	No
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	91.0	-0.5	No
33	Grand Avenue / 4 <sup>th</sup> Street	A	4.6	A	4.6	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	E	71.6	E	73.5	1.9	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	21.3	0.5	No
36	Grand Avenue / 5 <sup>th</sup> Street	E	58.5	E	63.1	<b>4.6</b>	<b>Yes</b>
37	Olive Street / 5 <sup>th</sup> Street	E	61.6	E	61.4	-0.2	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	98.4	F	98.3	-0.1	No

Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts							
No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	C	32.3	0.4	No
40	Hope Street / 6 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	C	22.3	C	22.3	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	C	31.8	C	31.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	F	206.8	F	208.7	1.9	No
44	Flower Street / Wilshire Blvd.	D	44.2	D	48.5	<b>4.3</b>	<b>Yes</b>
45	Figueroa Street / 7 <sup>th</sup> Street	D	51.4	D	52.4	1.0	No
46	Flower Street / 7 <sup>th</sup> Street	F	131.6	F	133.1	1.5	No
47	Hope Street / 7 <sup>th</sup> Street	B	16.3	D	16.3	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	C	29.0	C	29.2	0.2	No
49	Olive Street / 7 <sup>th</sup> Street	C	20.6	C	21.4	0.8	No
50	Figueroa Street / 8 <sup>th</sup> Street	F	94.2	F	97.6	<b>3.4</b>	<b>Yes</b>
51	Flower Street / 8 <sup>th</sup> Street	F	91.8	F	93.8	2.0	No
52	Hope Street / Temple Street	E	60.2	E	60.2	0.0	No
53	Grand Avenue / Temple Street	F	106.6	F	106.8	0.2	No
54	Hill Street / Temple Street	F	95.1	F	97.6	<b>2.5</b>	<b>Yes</b>
55	Broadway / Temple Street	E	69.1	E	73.3	<b>4.2</b>	<b>Yes</b>
56	Spring Street / Temple Street	B	18.6	B	18.9	0.3	No
57	Main Street / Temple Street	C	30.2	C	30.9	0.7	No
58	Los Angeles Street / Temple	C	32.7	C	34.0	1.3	No

Table 5-2. Year 2035 TSM Alternative: Intersection LOS and Impacts							
No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
	Street						
59	Judge John Aiso Street / Temple Street	B	15.7	B	16.0	0.3	No
60	Alameda Street / Temple Street	E	77.1	F	79.1	2.0	No
61	Los Angeles Street / Aliso Street	C	21.7	C	21.8	0.1	No
62	Alameda Street / Aliso Street	D	48.9	D	49.7	0.8	No
63	Los Angeles Street / Arcadia Street	B	16.3	B	16.4	0.1	No
64	Alameda Street / Arcadia Street	F	148.5	F	150.3	1.8	No
65-1	Alameda Street / Los Angeles Street N.	C	26.2	C	28.1	1.9	No
65-2	Alameda Street / Los Angeles Street S.	B	15.4	B	15.9	0.5	No
66	Dewap Rd. / 1 <sup>st</sup> Street	F	75.4	F	75.4	0.0	No
67	Olive Street / 1 <sup>st</sup> Street	C	25.1	C	25.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	E	57.8	E	57.8	0.0	No
69	S. Hope Street / 2 <sup>nd</sup> Street	C	32.0	C	32.0	0.0	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	C	24.3	C	24.3	0.0	No
71	Broadway / Arcadia Street	D	45.2	D	45.2	0.0	No
72	Spring Street / Arcadia Street	B	10.4	B	10.4	0.0	No
73	Main Street / Arcadia Street	B	15.6	B	15.6	0.0	No

No.	Intersection	No Build		TSM		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
74	Broadway / Aliso Street	C	21.9	C	21.9	0.0	No
75	Spring Street / Aliso Street	B	11.1	B	11.1	0.0	No
76	Main Street / Aliso Street	B	16.5	B	16.5	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	D	45.4	D	45.4	0.0	No
78	Olive Street / 4 <sup>th</sup> Street	E	61.5	E	61.5	0.0	No
79	Broadway / 4 <sup>th</sup> Street	C	22.1	C	22.1	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	C	21.4	C	21.4	0.0	No
81	Main Street / 4 <sup>th</sup> Street	C	34.7	C	34.7	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	C	33.1	C	33.1	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	B	19.9	B	19.9	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	B	19.6	B	19.6	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	F	131.1	F	131.1	0.0	No

### 5.1.2.3 Parking

The TSM Alternative would have no impact on the number of on-street parking and loading spaces within the project area where bus stops already exist. However, there is currently no bus service along portions of the Lower Grand route on 2<sup>nd</sup> Street, and up to 24 curbside parking and loading spaces would need to be removed to accommodate new bus zones. The actual size of the bus zones would be determined pending further consultation with LADOT, and attempts would be made to minimize the number of parking spaces removed. However, the parking impacts identified for the TSM alternative would be significant.

### 5.1.2.4 Other Modes

The TSM Alternative has no impacts on bicycle or pedestrian facilities in the project area. Any impacts that could occur under this alternative would be less than significant.

### 5.1.3 At-Grade Emphasis LRT Alternative

#### 5.1.3.1 Transit

The At-Grade Emphasis LRT Alternative includes a light rail alignment to provide a link between the 7<sup>th</sup> Street/Metro Center Station and Metro Gold Line at Temple and Alameda Streets. All of the provisions of the No Build Alternative would be included. The alignment east of 2<sup>nd</sup> and Hope Streets and the crossing at the 3<sup>rd</sup> and Flower Streets intersection would be at-grade and the remainder (Flower Street between 7<sup>th</sup> and 3<sup>rd</sup> Streets along with the station at 2<sup>nd</sup> and Hope Streets) would be underground.

The Regional Connector project would provide a direct east-west route between I-605 vicinity and Santa Monica and a direct north-south route between the Cities of Azusa and Long Beach. Consequently, transit patrons could travel from east-west or north-south without having to make a transfer in the downtown area. With this alternative, the existing Little Tokyo/Arts District Station would serve only east-west travel. Passengers originating in the communities of Little Tokyo and Arts District would need to board trains at the Main/Los Angeles couplet stations to make trips north and south, or board a train at Little Tokyo/Arts District Station and transfer after one stop.

For the At-Grade Emphasis LRT Alternative, the total daily system wide linked transit trips for the entire bus and rail system is projected to be about 1,729,400, which is a 12,300-trip increase over the No Build Alternative and a 7,000-trip increase over the TSM Alternative. Daily urban rail boardings for this alternative are projected to be 275,700 at the Metro Blue Line, Metro Gold Line, Metro Expo Line, and the proposed new Regional Connector stations combined. The projections show an increase of about 17,200 in urban rail boardings, which is a benefit of this alternative. It is also expected that the theoretical carrying capacity of the LRT system would be approximately 13,000 passengers per hour in each direction.

Bus operating speeds may decrease because of the proposed traffic lane reductions along Flower, 2<sup>nd</sup>, Main, Los Angeles, Temple, and Alameda Streets, which would negatively impact congestion on these streets. In addition, eastbound bus stops on 2<sup>nd</sup> Street would be displaced and buses traveling eastbound on 2<sup>nd</sup> Street would be shifted to adjacent roadways such as 1<sup>st</sup> or 4<sup>th</sup> Streets. Bus schedules would be adjusted to reflect modified traffic conditions and travel times. However, from an urban rail perspective, this alternative would have a significant benefit when compared to both the No Build and TSM Alternatives. In summary, the transit impacts identified under this alternative would be less than significant.

#### 5.1.3.2 Traffic Circulation

The At-Grade Emphasis LRT Alternative consists of both at-grade segment and underground segments of the alignment. The primary at-grade segment runs along 2<sup>nd</sup> Street, splits to a one-way, one-track couplet on Main and Los Angeles Streets, then realigns into a dual-track configuration continuing on Temple Street and connecting with the existing Gold Line tracks

on Alameda Street. To accommodate at-grade operations, one traffic lane would be removed in each direction for the dual-track configuration on 2<sup>nd</sup> and Temple Streets and one traffic lane would be removed for the one-track couplet on Main and Los Angeles Streets. In addition, one traffic lane would be removed on Flower Street between 6<sup>th</sup> and 4<sup>th</sup> Streets to accommodate underground station pedestrian portals and two traffic lanes would be removed between 4<sup>th</sup> and 3<sup>rd</sup> Streets to accommodate the train portal.

Due to the narrow width of 2<sup>nd</sup> Street, only one westbound travel lane would be maintained to provide local business and driveway access and the two eastbound travel lanes between Hill and Main Streets would be eliminated. Consequently, eastbound through traffic would be diverted to 1<sup>st</sup> and 4<sup>th</sup> Streets and westbound through traffic would be diverted to 1<sup>st</sup> and 3<sup>rd</sup> Streets.

The proposed Alameda Street underpass at Temple Street would result in localized traffic shifts to adjacent intersections because some of the at-grade north-south turn movements from Alameda Street to Temple Street would be eliminated. These shifts in traffic patterns and roadway circulation are reflected in the year 2035 AM and PM peak hour traffic forecasts for the At-Grade Emphasis LRT Alternative and the reduction in traffic lanes is reflected in the intersection lane configurations.

The traffic signals along the LRT alignment would require modifications for at-grade operations to provide adequate time for the trains to safely clear an intersection. The intersection analysis accounts for this exclusive signal phase for LRT operations that would be necessary at most locations. The analysis incorporated an LRT green time phase ranging from 30 to 60 seconds, depending on the intersection and track configuration, to account for the safe movement of the trains through an intersection. The calculation of the LRT green time is based on the following assumptions:

- Operation of three-car trains at 5-minute headways per direction per route during peak hours, yielding trains every 2.5 minutes in each direction on the Regional Connector tracks.
- A three-car train length of approximately 270 feet.
- An average street running operating speed of 25 miles per hour with recognition that trains coming toward or leaving a station will be traveling at reduced speeds between 5 and ten miles per hour.
- An average cross-street width of 80 to 100 feet, depending on location.
- A safety clearance time of 20 seconds.



Future traffic operations were modeled with the Synchro software and the evaluation incorporated the AM and PM peak hour turn volumes, roadway geometrics, type of control, and signal phasing including the LRT component, where applicable. The results of the traffic analysis for this alternative and corresponding AM and PM peak hour levels of service are presented in Table 5-3. In addition, the table highlights in bold the intersections that exceed the significance threshold and would be significantly impacted due to the At-Grade Emphasis LRT Alternative.

The results indicate that under the At-Grade Emphasis LRT Alternative, 65 intersections would continue to operate at LOS D or better in the AM peak hour and 48 intersections would continue to operate at LOS D or better in the PM peak hour. In the AM peak hour, seven intersections would operate at LOS E and 13 intersections would operate at LOS F. In the PM peak hour, these numbers would increase to 12 intersections operating at LOS E and 25 operating at LOS F. Many of these intersections would operate at the same level of service as projected for the No Build Alternative.

Intersections that would be impacted include those that are projected to have a significant negative change in LOS when compared to the No Build Alternative conditions. As defined in Section 3.1, the significance of an impact is related to the magnitude in the change in delay. During the AM peak hour 18 intersections and during the PM peak hour 26 intersections would experience significant adverse impacts under the At-Grade LRT Alternative.

The table also shows that a number of intersections would improve from the No Build Alternative by virtue of a reduction in delays. During the AM peak hour, seven intersections show delay improvements and eight intersections show delay improvements during the PM peak hour.

In summary, the traffic circulation impacts identified under this alternative would be significant.

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	65.3	E	65.3	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	C	24.1	D	35.7	<b>11.6</b>	<b>Yes</b>

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
3	Broadway / 1 <sup>st</sup> Street	C	24.0	C	23.9	-0.1	No
4	Spring Street / 1 <sup>st</sup> Street	B	17.3	B	17.5	0.2	No
5	Main Street / 1 <sup>st</sup> Street	B	16.5	C	23.5	<b>7.0</b>	<b>Yes</b>
6	Los Angeles Street / 1 <sup>st</sup> Street	B	16.6	C	23.1	<b>6.5</b>	<b>Yes</b>
7	Judge John Aiso Street / 1 <sup>st</sup> Street	B	13.9	B	13.5	-0.4	No
8	Central Avenue / 1 <sup>st</sup> Street	A	5.8	A	5.9	0.1	No
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	E	76.2	<b>31.8</b>	<b>Yes</b>
10	Figueroa Street / 2 <sup>nd</sup> Street	C	25.8	C	25.8	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	13.6	B	13.6	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.7	F	496.7	<b>477.0</b>	<b>Yes</b>
13	Broadway / 2 <sup>nd</sup> Street	B	18.4	C	32.5	<b>14.1</b>	<b>Yes</b>
14	Spring Street / 2 <sup>nd</sup> Street	C	25.3	C	25.7	0.4	No
15	Main Street / 2 <sup>nd</sup> Street	B	12.9	B	12.0	-0.9	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	14.8	E	77.8	<b>63.0</b>	<b>Yes</b>
17	San Pedro Street / 2 <sup>nd</sup> Street	B	14.5	B	14.5	0.0	No
18	Central Avenue / 2 <sup>nd</sup> Street	A	9.9	A	9.9	0.0	No
19	Alameda Street / 2 <sup>nd</sup> Street	B	15.9	B	15.9	0.0	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	98.5	F	98.5	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	C	28.4	D	45.8	<b>17.4</b>	<b>Yes</b>

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
22	Grand Avenue / 3 <sup>rd</sup> Street	A	9.6	A	9.6	0.0	No
23	Hill Street / 3 <sup>rd</sup> Street	E	58.7	F	114.2	<b>55.5</b>	<b>Yes</b>
24	Broadway / 3 <sup>rd</sup> Street	F	86.9	F	119.6	<b>32.7</b>	<b>Yes</b>
25	Spring Street / 3 <sup>rd</sup> Street	F	87.8	F	104.9	<b>17.1</b>	<b>Yes</b>
26	Main Street / 3 <sup>rd</sup> Street	C	22.7	D	36.0	<b>13.3</b>	<b>Yes</b>
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	67.1	F	88.7	<b>21.6</b>	<b>Yes</b>
28	San Pedro Street / 3 <sup>rd</sup> Street	C	23.7	C	23.7	0.0	No
29	Central Avenue / 3 <sup>rd</sup> Street	C	25.2	C	25.2	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	F	82.9	F	82.9	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	18.0	B	18.0	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	F	199.3	<b>159.7</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	3.0	A	3.0	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	B	16.5	B	16.5	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	27.1	4.8	No
36	Grand Avenue / 5 <sup>th</sup> Street	C	21.8	C	21.8	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	C	20.8	C	20.8	0.0	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	104.0	F	104.0	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	D	36.1	3.5	No
40	Hope Street / 6 <sup>th</sup> Street	A	7.3	A	7.3	0.0	No

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
41	Grand Avenue / 6 <sup>th</sup> Street	B	16.4	B	16.4	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	B	18.8	B	18.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	E	61.6	E	61.6	0.0	No
44	Flower Street / Wilshire Blvd.	D	41.0	D	41.0	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	C	24.8	C	24.8	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	B	13.8	B	13.8	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	10.7	B	10.7	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	B	16.6	B	16.6	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
52	Hope Street / Temple Street	D	36.5	D	36.5	0.0	No
53	Grand Avenue / Temple Street	F	94.4	F	94.4	0.0	No
54	Hill Street / Temple Street	D	35.2	D	35.2	0.0	No
55	Broadway / Temple Street	E	70.1	E	70.1	0.0	No
56	Spring Street / Temple Street	C	27.5	C	27.5	0.0	No
57	Main Street / Temple Street	B	11.4	C	23.9	<b>12.5</b>	<b>Yes</b>
58	Los Angeles Street / Temple Street	B	19.7	F	166.9	<b>147.2</b>	<b>Yes</b>
59	Judge John Aiso Street / Temple Street	A	5.6	B	19.2	13.6	No

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
60	Alameda Street / Temple Street	C	29.9	A	6.3	-23.6	No
61	Los Angeles Street / Aliso Street	B	12.9	B	12.6	-0.3	No
62	Alameda Street / Aliso Street	F	88.5	F	101.6	<b>13.1</b>	<b>Yes</b>
63	Los Angeles Street / Arcadia Street	B	14.4	B	14.4	0.0	No
64	Alameda Street / Arcadia Street	E	64.7	E	64.7	0.0	No
65-1	Alameda Street / Los Angeles Street N.	D	40.4	D	40.4	0.0	No
65-2	Alameda Street / Los Angeles Street S.	A	6.5	A	6.5	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	A	5.7	A	5.7	0.0	No
67	Olive Street / 1 <sup>st</sup> Street	B	16.1	B	16.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	F	99.7	E	69.0	-30.7	No
69	S. Hope Street / 2 <sup>nd</sup> Street	A	7.5	B	11.1	3.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	B	18.2	A	7.2	-11.0	No
71	Broadway / Arcadia Street	B	12.8	B	12.8	0.0	No
72	Spring Street / Arcadia Street	B	16.3	B	16.3	0.0	No
73	Main Street / Arcadia Street	A	9.4	A	9.4	0.0	No
74	Broadway / Aliso Street	B	19.6	B	19.6	0.0	No
75	Spring Street / Aliso Street	B	11.4	B	11.4	0.0	No
76	Main Street / Aliso Street	A	6.8	A	6.8	0.0	No

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
77	Hill Street / 4 <sup>th</sup> Street	B	18.3	F	215.8	<b>197.5</b>	<b>Yes</b>
78	Olive Street / 4 <sup>th</sup> Street	B	17.0	B	17.0	0.0	No
79	Broadway / 4 <sup>th</sup> Street	B	14.8	B	18.5	3.7	No
80	Spring Street / 4 <sup>th</sup> Street	B	13.9	B	15.8	1.9	No
81	Main Street / 4 <sup>th</sup> Street	B	11.8	B	13.4	1.6	No
82	Los Angeles Street / 4 <sup>th</sup> Street	B	10.6	B	12.8	2.2	No
83	San Pedro Street / 4 <sup>th</sup> Street	A	8.1	A	8.1	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	A	8.2	A	8.2	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	B	12.0	B	12.0	0.0	No
<b>PM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	56.2	E	56.2	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	E	67.2	F	86.9	<b>19.7</b>	<b>Yes</b>
3	Broadway / 1 <sup>st</sup> Street	C	30.5	D	53.6	<b>23.1</b>	<b>Yes</b>
4	Spring Street / 1 <sup>st</sup> Street	B	15.7	B	16.4	0.7	No
5	Main Street / 1 <sup>st</sup> Street	D	53.0	F	107.9	<b>54.9</b>	<b>Yes</b>
6	Los Angeles Street / 1 <sup>st</sup> Street	F	102.9	F	126.2	<b>23.3</b>	<b>Yes</b>
7	Judge John Aiso Street / 1 <sup>st</sup> Street	C	21.1	C	20.6	-0.5	No
8	Central Avenue / 1 <sup>st</sup> Street	B	14.1	B	13.7	-0.4	No
9	Alameda Street / 1 <sup>st</sup> Street	F	97.6	F	101.7	<b>4.1</b>	<b>Yes</b>

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
10	Figueroa Street / 2 <sup>nd</sup> Street	F	120.7	F	120.7	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	16.7	B	16.7	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.9	F	438.9	<b>419.0</b>	<b>Yes</b>
13	Broadway / 2 <sup>nd</sup> Street	C	20.6	C	30.5	<b>9.9</b>	<b>Yes</b>
14	Spring Street / 2 <sup>nd</sup> Street	B	14.5	B	15.2	0.7	No
15	Main Street / 2 <sup>nd</sup> Street	C	33.9	B	18.5	-15.4	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	C	34.4	E	55.2	<b>20.8</b>	<b>Yes</b>
17	San Pedro Street / 2 <sup>nd</sup> Street	B	19.1	B	19.1	0.0	No
18	Central Avenue / 2 <sup>nd</sup> Street	B	10.2	B	10.2	0.0	No
19	Alameda Street / 2 <sup>nd</sup> Street	C	33.1	C	33.1	0.0	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	140.9	F	140.9	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	B	15.7	C	31.7	<b>16.0</b>	<b>Yes</b>
22	Grand Avenue / 3 <sup>rd</sup> Street	B	13.3	B	13.3	0.0	No
23	Hill Street / 3 <sup>rd</sup> Street	D	48.5	E	65.3	<b>16.8</b>	<b>Yes</b>
24	Broadway / 3 <sup>rd</sup> Street	E	65.7	F	99.1	<b>33.4</b>	<b>Yes</b>
25	Spring Street / 3 <sup>rd</sup> Street	E	55.9	F	87.7	<b>31.8</b>	<b>Yes</b>
26	Main Street / 3 <sup>rd</sup> Street	D	39.1	D	50.7	<b>11.6</b>	<b>Yes</b>
27	Los Angeles Street / 3 <sup>rd</sup> Street	C	23.9	D	41.9	<b>18.0</b>	<b>Yes</b>
28	San Pedro Street / 3 <sup>rd</sup> Street	B	13.9	B	13.9	0.0	No

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
29	Central Avenue / 3 <sup>rd</sup> Street	B	15.3	B	15.3	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	E	57.1	E	57.1	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	19.4	B	19.4	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	135.1	<b>43.6</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	4.6	A	4.6	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	E	71.6	E	71.6	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	27.9	<b>7.1</b>	<b>Yes</b>
36	Grand Avenue / 5 <sup>th</sup> Street	E	58.5	E	58.5	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	E	61.6	E	61.6	0.0	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	98.4	F	98.4	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	D	38.4	<b>6.5</b>	<b>Yes</b>
40	Hope Street / 6 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	C	22.3	C	22.3	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	C	31.8	C	31.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	F	206.8	F	206.8	0.0	No
44	Flower Street / Wilshire Blvd.	D	44.2	D	44.2	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	D	51.4	D	51.4	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	F	131.6	F	131.6	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	16.3	B	16.3	0.0	No



**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
48	Grand Avenue / 7 <sup>th</sup> Street	C	29.0	C	29.0	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	C	20.6	C	20.6	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	F	94.2	F	94.2	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	F	91.8	F	91.8	0.0	No
52	Hope Street / Temple Street	E	60.2	E	60.2	0.0	No
53	Grand Avenue / Temple Street	F	106.6	F	106.6	0.0	No
54	Hill Street / Temple Street	F	95.1	F	95.1	0.0	No
55	Broadway / Temple Street	E	69.1	E	69.1	0.0	No
56	Spring Street / Temple Street	B	18.6	B	18.6	0.0	No
57	Main Street / Temple Street	C	30.2	F	147.0	<b>116.8</b>	<b>Yes</b>
58	Los Angeles Street / Temple Street	C	32.7	F	900.6	<b>867.9</b>	<b>Yes</b>
59	Judge John Aiso Street / Temple Street	B	15.7	F	124.5	<b>108.8</b>	<b>Yes</b>
60	Alameda Street / Temple Street	E	77.1	B	15.5	-61.6	No
61	Los Angeles Street / Aliso Street	C	21.7	D	48.1	<b>26.4</b>	<b>Yes</b>
62	Alameda Street / Aliso Street	D	48.9	F	91.1	<b>42.2</b>	<b>Yes</b>
63	Los Angeles Street / Arcadia Street	B	16.3	B	16.3	0.0	No
64	Alameda Street / Arcadia Street	F	148.5	F	148.5	0.0	No
65-1	Alameda Street / Los Angeles Street N.	C	26.2	C	26.2	0.0	No

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
65-2	Alameda Street / Los Angeles Street S.	B	15.4	B	15.4	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	F	75.4	F	56.1	-19.3	No
67	Olive Street / 1 <sup>st</sup> Street	C	25.1	C	25.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	E	57.8	D	51.8	-6.0	No
69	S. Hope Street / 2 <sup>nd</sup> Street	C	32.0	C	27.4	-4.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	C	24.3	C	20.9	-3.4	No
71	Broadway / Arcadia Street	D	45.2	D	45.2	0.0	No
72	Spring Street / Arcadia Street	B	10.4	B	10.4	0.0	No
73	Main Street / Arcadia Street	B	15.6	B	15.6	0.0	No
74	Broadway / Aliso Street	C	21.9	C	21.9	0.0	No
75	Spring Street / Aliso Street	B	11.1	B	11.1	0.0	No
76	Main Street / Aliso Street	B	16.5	B	16.5	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	D	45.4	F	415.1	<b>369.7</b>	<b>Yes</b>
78	Olive Street / 4 <sup>th</sup> Street	E	61.5	E	61.5	0.0	No
79	Broadway / 4 <sup>th</sup> Street	C	22.1	E	67.6	<b>45.5</b>	<b>Yes</b>
80	Spring Street / 4 <sup>th</sup> Street	C	21.4	C	29.3	<b>7.9</b>	<b>Yes</b>
81	Main Street / 4 <sup>th</sup> Street	C	34.7	E	68.7	<b>34.0</b>	<b>Yes</b>
82	Los Angeles Street / 4 <sup>th</sup> Street	C	33.1	D	35.6	2.5	No

**Table 5-3. Year 2035 At-Grade Emphasis LRT Alternative: Intersection LOS and Impacts**

No.	Intersection	No Build		At-Grade Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
83	San Pedro Street / 4 <sup>th</sup> Street	B	19.9	B	19.9	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	B	19.6	B	19.6	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	F	131.1	F	131.1	0.0	No

### 5.1.3.3 Parking

Portions of the At-Grade Emphasis LRT Alternative alignment would utilize existing roadway space for tracks, surface street stations, underground station pedestrian portals, and a roadway underpass on Alameda Street. There would be a reduction in traffic lanes and/or parking spaces along the street segments at these locations. The number of parking and loading spaces that would be removed was estimated based on the characteristics of each street segment and the proposed LRT street cross-sections. The expected impacts along each of the street segments that the alignment would traverse are discussed below.

*Flower Street*—Between 5<sup>th</sup> and 3<sup>rd</sup> Streets, seven of the 13 on-street parking spaces on the east side of the street and all five on-street parking spaces on the west side of the street would also be removed. Due to the relatively wide sidewalk, the loading spaces on both the east and west sides of the streets would be maintained by creating a loading bay area.

*2<sup>nd</sup> Street*—The LRT alignment would run on 2<sup>nd</sup> Street in an at-grade configuration between Hill and Los Angeles Streets. In this segment of the street there are no parking or loading spaces on the north side and parking and loading on the south side is prohibited during the AM and PM peak hours. Consequently, there would be no impacts to parking and loading during the peak hours. However, the 23 on-street parking spaces and five loading spaces on the south side of the street, which are currently available during the off-peak period (9 AM to 4 PM), would be eliminated to accommodate the LRT track configuration along with a travel lane to provide local business and driveway access.

*Main Street*—A single track would run on the east side of Main Street for southbound /westbound trains between 2<sup>nd</sup> and Temple Streets. The loading configuration on the west side of Main Street would be maintained; however, the 11 loading spaces on the east side of the street would be eliminated. In addition, there are two driveways on the east side of the street that provide access to the off-street parking for the Caltrans/LADOT building. These

could be maintained by providing adequate warning signage and other safety provisions to minimize potential train and vehicular conflicts.

*Los Angeles Street* – Similar to Main Street, a single track would run on the east side of Los Angeles Street for northbound/eastbound trains between 2<sup>nd</sup> and Temple Streets. The loading configuration on the west side of Los Angeles Street would be maintained; however, the 10 loading spaces on the east side of the street would be eliminated. In addition, two driveways on the east side of the street that provide access to adjacent businesses could be maintained by providing adequate warning signage and other safety provisions to minimize potential train and vehicular conflicts.

*Temple Street* – The LRT alignment would run at-grade in the center of Temple Street between Main and Judge John Aiso Streets and then shift to the south side of the street between Judge John Aiso and Alameda Streets. On the north side of the street, the four off-peak parking spaces between Main and Los Angeles Streets would be eliminated; however due to the shift of the tracks, the four loading spaces between Judge John Aiso and Alameda Streets would be maintained. On the south side of Temple Street, the 12 on-street parking spaces would be eliminated. In addition, the driveway on the south side of the street could be maintained by providing adequate warning signage and other safety provisions to minimize potential train and vehicular conflicts.

*Alameda Street* – The proposed Alameda Street underpass at Temple Street would impact the segment of the street between Aliso and 1<sup>st</sup> Streets. In this segment, the three bus tour loading spaces on the west side of the street adjacent to the Japanese American National Museum (JANM) would be eliminated. However, access to the JANM loading dock would be maintained.

The parking impacts identified under the At-Grade Emphasis LRT Alternative would not be considered adverse or significant.

#### 5.1.3.4 Other Modes

For the At-Grade Emphasis LRT Alternative, the street and intersection locations where the LRT would have an at-grade profile include Flower Street between 4<sup>th</sup> and 3<sup>rd</sup> Streets, 2<sup>nd</sup> Street between Hill and Los Angeles Streets, Main and Los Angeles Streets between Temple and 2<sup>nd</sup> Streets, Temple Street between Main and Alameda Streets, and Alameda Street between Aliso and 2<sup>nd</sup> Streets. The alignment would utilize existing roadway space for tracks, surface street stations, underground station pedestrian portals, and a roadway underpass on Alameda Street. The reduction in travel lanes would impact bikeways and pedestrian crosswalks and sidewalks as it would traffic and transit.

The sidewalk along Flower Street between 6<sup>th</sup> and 3<sup>rd</sup> Streets and along 2<sup>nd</sup> Street between Hill and Los Angeles Streets would be maintained and could be widened. No pedestrian impacts

would be expected for the at-grade segments of the alignment. A station is proposed on each side of the one-way couplet on Main and Los Angeles Streets just north of 1<sup>st</sup> Street. At station areas, the LRT would be located near major signalized intersections, where pedestrian crosswalks are currently in place. The station layouts would be designed for pedestrian convenience and safety, leading to crosswalks at signalized intersections to guide pedestrians toward safe flow patterns.

The sidewalk and its associated width along Temple Street would be maintained. Where the tracks would cross Alameda Street, a pedestrian bridge is proposed to reduce potential conflicts between pedestrians, trains, and automobiles.

The possibility of conflicts between trains and pedestrians may also occur at the tunnel portal location on Flower Street south of 3<sup>rd</sup> Street where pedestrians could attempt to enter the tunnel during daytime operations or at night. Signing and surveillance would be utilized at tunnel portals to reduce the possibility of unauthorized tunnel entry. Potentially significant pedestrian safety issues associated with unauthorized pedestrian crossings of the tracks would be addressed during design and utilize Metro standards to minimize possible conflicts. A pedestrian bridge could also be constructed between the 2<sup>nd</sup>/Hope Street station and Upper Grand Avenue to enhance the connection to Bunker Hill.

The at-grade alignment would not directly impact designated bicycle routes. However, some of the through traffic currently on 2<sup>nd</sup> Street would be expected to shift onto 1<sup>st</sup> Street. Consequently, the flow of bicycle traffic could be impacted due to increased traffic volumes on 1<sup>st</sup> Street. Bicyclists could be traveling in a more congested environment due to the projected increase in traffic volumes on 1<sup>st</sup> Street.

Similarly, the proposed underpass at Alameda and Temple Streets would be expected to divert some local traffic to adjacent streets, such as Central Avenue, because of potential changes in traffic circulation patterns. Central Avenue is designated as a Class III bicycle route. Therefore, the flow of bicycle traffic could be impacted due to increased traffic volumes on Central Avenue as a result of this potential localized shift in traffic. Potential bicycle impacts identified under this alternative would be significant.

Transit stations would be provided with bike lockers and racks, increasing the bicycle facilities in the area and creating a positive impact. In addition, pedestrian level lighting at stations would improve the attractiveness and perception of safety, specifically in the evening hours, creating a positive effect for patrons and the community.

## 5.1.4 Underground Emphasis LRT Alternative

### 5.1.4.1 Transit

The Underground Emphasis LRT Alternative would include an underground light rail alignment to provide a link between the 7<sup>th</sup> Street/Metro Center Station and Metro Gold Line at 1<sup>st</sup> and Alameda Streets. All of the provisions of the No Build Alternative would be included.

The proposed alignment would surface to an at-grade configuration on Alameda Street at 1<sup>st</sup> Street. This alternative would provide a direct east-west route between Santa Monica and the I-605 vicinity and a direct north-south route between Azusa and Long Beach. Consequently, transit patrons could travel from east-west or north-south without having to make a transfer in the downtown area.

The existing Little Tokyo/Arts District Station would serve only patrons traveling along the north-south route. Patrons from the Little Tokyo and Arts District communities would need to board a train at the proposed 2<sup>nd</sup> and Broadway station or the 2<sup>nd</sup> and Los Angeles station, whichever is selected, to travel east and west. Alternatively, patrons could board a train at the Little Tokyo/Arts District Station and transfer at the next stop.

For the Underground Emphasis LRT Alternative, the total daily system wide linked transit trips for the entire bus and rail system is projected to be about 1,732,000, which would be a 14,900-trip increase over the No Build Alternative and a 9,600-trip increase over the TSM Alternative. The daily urban rail boarding count for this alternative is projected to be 280,000 at the Metro Blue Line, Metro Gold Line, Metro Expo Line, and the proposed new Regional Connector stations combined. The projections show an increase of about 21,500 in urban rail boardings, which would be a positive impact of this alternative. The theoretical carrying capacity of the downtown LRT system would be approximately 13,000 passengers per hour in each direction under this alternative.

Bus operating speeds may increase due to proposed traffic lane reductions along Flower and Alameda Streets that would impact congestion on these streets. Bus schedules would be adjusted to reflect modified traffic conditions and travel times. However, from an urban rail perspective, this alternative shows a significant positive impact compared to both the No Build and TSM Alternatives. In summary, the transit impacts identified under this alternative would be less than significant.

### 5.1.4.2 Traffic Circulation

The Underground Emphasis LRT Alternative would be a predominantly underground alignment with one at-grade segment crossing Alameda Street to connect with the Gold Line tracks at the Little Tokyo/Arts District Station. To accommodate pedestrian portals to an underground station, one traffic lane would be removed on the east side of Flower Street

between 6<sup>th</sup> and 4<sup>th</sup> Streets. The proposed Alameda Street underpass at 1<sup>st</sup> Street would result in localized traffic shifts to adjacent intersections because some of the at-grade north-south turn movements from Alameda Street to 1<sup>st</sup> Street would be eliminated.

The at-grade segment of the Underground Emphasis LRT Alternative would require modifications to the traffic signal at 1<sup>st</sup> and Alameda Streets to provide adequate time for the trains to safely clear the intersection. In this area, some of the trains would be traveling at slow speeds because they would be approaching or leaving the Little Tokyo/Arts District Station.

These local shifts in traffic patterns and changes to the roadway circulation are reflected in the year 2035 AM and PM peak hour traffic forecasts for the Underground Emphasis LRT Alternative, and the proposed reduction in traffic lanes is reflected in the intersection lane configurations.

The results of the traffic analysis for this alternative and corresponding predicted AM and PM peak hour levels of service are presented in Table 5-4. In addition, the table highlights in bold the intersections that would exceed the significance threshold and that would be expected to be significantly impacted due to the Underground Emphasis LRT Alternative.

The results indicate that under the Underground Emphasis LRT Alternative, 69 intersections would continue to operate at LOS D or better in the AM peak hour and 55 would continue to operate at LOS D or better in the PM peak hour. In the AM peak hour, seven intersections would operate at LOS E and nine would operate at LOS F. In the PM peak hour, these numbers increase to 13 intersections operating at LOS E and 17 operating at LOS F. Many of these intersections would operate at the same level of service as projected for the No Build Alternative.

Intersections that would be impacted include those that are projected to have a significant negative change in LOS when compared to the No Build Alternative conditions. As defined in Section 3.1, the significance of an impact is related to the magnitude in the change in delay. Only three intersections during the AM peak hour and only seven intersections during the PM peak hour would experience significant adverse impacts of the Underground Emphasis LRT Alternative.

Table 5-4 also shows that a number of intersections would improve when compared to the No Build Alternative by virtue of a reduction in delays. During the AM peak hour, five intersections show delay improvements, while eight intersections show delay improvements in the PM peak hour. The Underground Emphasis LRT Alternative would increase the person-carrying capacity through the downtown transportation environment without adversely impacting overall traffic operations.

In summary, the traffic circulation impacts identified under this alternative would be significant.

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	65.3	E	65.3	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	C	24.1	C	24.1	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	24.0	C	24.0	0.0	No
4	Spring Street / 1 <sup>st</sup> Street	B	17.3	B	17.3	0.0	No
5	Main Street / 1 <sup>st</sup> Street	B	16.5	B	16.5	0.0	No
6	Los Angeles Street / 1 <sup>st</sup> Street	B	16.6	B	16.6	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	B	13.9	B	14.8	0.9	No
8	Central Avenue / 1 <sup>st</sup> Street	A	5.8	A	9.4	3.6	No
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	A	6.1	-38.3	No
10	Figueroa Street / 2 <sup>nd</sup> Street	C	25.8	C	25.8	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	13.6	B	13.6	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.7	B	19.7	0.0	No
13	Broadway / 2 <sup>nd</sup> Street	B	18.4	B	18.4	0.0	No
14	Spring Street / 2 <sup>nd</sup> Street	C	25.3	C	25.3	0.0	No
15	Main Street / 2 <sup>nd</sup> Street	B	12.9	B	12.9	0.0	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	14.8	B	14.8	0.0	No



**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
17	San Pedro Street / 2 <sup>nd</sup> Street	B	14.5	B	14.0	-0.5	No
18	Central Avenue / 2 <sup>nd</sup> Street	A	9.9	B	12.0	2.1	No
19	Alameda Street / 2 <sup>nd</sup> Street	B	15.9	F	127.5	<b>111.6</b>	<b>Yes</b>
20	Figueroa Street / 3 <sup>rd</sup> Street	F	98.5	F	98.5	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	C	28.4	C	28.4	0.0	No
22	Grand Avenue / 3 <sup>rd</sup> Street	A	9.6	A	9.6	0.0	No
23	Hill Street / 3 <sup>rd</sup> Street	E	58.7	E	58.7	0.0	No
24	Broadway / 3 <sup>rd</sup> Street	F	86.9	F	86.9	0.0	No
25	Spring Street / 3 <sup>rd</sup> Street	F	87.8	F	87.8	0.0	No
26	Main Street / 3 <sup>rd</sup> Street	C	22.7	C	22.7	0.0	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	67.1	E	67.1	0.0	No
28	San Pedro Street / 3 <sup>rd</sup> Street	C	23.7	C	23.7	0.0	No
29	Central Avenue / 3 <sup>rd</sup> Street	C	25.2	C	25.2	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	F	82.9	F	82.9	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	18.0	B	18.0	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	F	102.9	<b>63.3</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	3.0	A	3.0	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	B	16.5	B	16.5	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	27.1	4.8	No

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
36	Grand Avenue / 5 <sup>th</sup> Street	C	21.8	C	21.8	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	C	20.8	C	20.8	0.0	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	104.0	F	104.0	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	D	36.1	3.5	No
40	Hope Street / 6 <sup>th</sup> Street	A	7.3	A	7.3	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	B	16.4	B	16.4	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	B	18.8	B	18.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	E	61.6	E	61.6	0.0	No
44	Flower Street / Wilshire Blvd.	D	41.0	D	41.0	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	C	24.8	C	24.8	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	B	13.8	B	13.8	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	10.7	B	10.7	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	B	16.6	B	16.6	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
52	Hope Street / Temple Street	D	36.5	D	36.5	0.0	No
53	Grand Avenue / Temple Street	F	94.4	F	94.4	0.0	No
54	Hill Street / Temple Street	D	35.2	D	35.2	0.0	No

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
55	Broadway / Temple Street	E	70.1	E	70.1	0.0	No
56	Spring Street / Temple Street	C	27.5	C	27.5	0.0	No
57	Main Street / Temple Street	B	11.4	B	11.4	0.0	No
58	Los Angeles Street / Temple Street	B	19.7	B	19.7	0.0	No
59	Judge John Aiso Street / Temple Street	A	5.6	A	7.5	1.9	No
60	Alameda Street / Temple Street	C	29.9	B	17.6	-12.3	No
61	Los Angeles Street / Aliso Street	B	12.9	B	12.9	0.0	No
62	Alameda Street / Aliso Street	F	88.5	F	93.2	<b>4.7</b>	<b>Yes</b>
63	Los Angeles Street / Arcadia Street	B	14.4	B	14.4	0.0	No
64	Alameda Street / Arcadia Street	E	64.7	E	64.7	0.0	No
65-1	Alameda Street / Los Angeles Street N.	D	40.4	D	40.4	0.0	No
65-2	Alameda Street / Los Angeles Street S.	A	6.5	A	6.5	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	A	5.7	A	5.7	0.0	No
67	Olive Street / 1 <sup>st</sup> Street	B	16.1	B	16.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	F	99.7	E	69.0	-30.7	No
69	S. Hope Street / 2 <sup>nd</sup> Street	A	7.5	B	11.1	3.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	B	18.2	A	7.2	-11.0	No

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
71	Broadway / Arcadia Street	B	12.8	B	12.8	0.0	No
72	Spring Street / Arcadia Street	B	16.3	B	16.3	0.0	No
73	Main Street / Arcadia Street	A	9.4	A	9.4	0.0	No
74	Broadway / Aliso Street	B	19.6	B	19.6	0.0	No
75	Spring Street / Aliso Street	B	11.4	B	11.4	0.0	No
76	Main Street / Aliso Street	A	6.8	A	6.8	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	B	18.3	B	18.3	0.0	No
78	Olive Street / 4 <sup>th</sup> Street	B	17.0	B	17.0	0.0	No
79	Broadway / 4 <sup>th</sup> Street	B	14.8	B	14.8	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
81	Main Street / 4 <sup>th</sup> Street	B	11.8	B	11.8	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	B	10.6	B	10.6	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	A	8.1	A	8.1	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	A	8.2	A	8.2	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	B	12.0	B	12.0	0.0	No
<b>PM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	56.2	E	56.2	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	E	67.2	E	67.2	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	30.5	C	30.5	0.0	No

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
4	Spring Street / 1 <sup>st</sup> Street	B	15.7	B	15.7	0.0	No
5	Main Street / 1 <sup>st</sup> Street	D	53.0	D	53.0	0.0	No
6	Los Angeles Street / 1 <sup>st</sup> Street	F	102.9	F	102.9	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	C	21.1	F	133.2	<b>112.1</b>	<b>Yes</b>
8	Central Avenue / 1 <sup>st</sup> Street	B	14.1	B	11.1	-3.0	No
9	Alameda Street / 1 <sup>st</sup> Street	F	97.6	A	7.0	-90.6	No
10	Figueroa Street / 2 <sup>nd</sup> Street	F	120.7	F	120.7	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	16.7	B	16.7	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.9	B	19.9	0.0	No
13	Broadway / 2 <sup>nd</sup> Street	C	20.6	C	20.6	0.0	No
14	Spring Street / 2 <sup>nd</sup> Street	B	14.5	B	14.5	0.0	No
15	Main Street / 2 <sup>nd</sup> Street	C	33.9	C	33.9	0.0	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	C	34.4	C	34.4	0.0	No
17	San Pedro Street / 2 <sup>nd</sup> Street	B	19.1	B	18.7	-0.4	No
18	Central Avenue / 2 <sup>nd</sup> Street	B	10.2	B	16.7	6.5	No
19	Alameda Street / 2 <sup>nd</sup> Street	C	33.1	F	133.2	<b>100.1</b>	<b>Yes</b>
20	Figueroa Street / 3 <sup>rd</sup> Street	F	140.9	F	140.9	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	B	15.7	B	15.5	-0.2	No
22	Grand Avenue / 3 <sup>rd</sup> Street	B	13.3	B	13.3	0.0	No

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
23	Hill Street / 3 <sup>rd</sup> Street	D	48.5	D	48.5	0.0	No
24	Broadway / 3 <sup>rd</sup> Street	E	65.7	E	65.7	0.0	No
25	Spring Street / 3 <sup>rd</sup> Street	E	55.9	E	55.9	0.0	No
26	Main Street / 3 <sup>rd</sup> Street	D	39.1	D	39.1	0.0	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	C	23.9	C	23.9	0.0	No
28	San Pedro Street / 3 <sup>rd</sup> Street	B	13.9	B	13.9	0.0	No
29	Central Avenue / 3 <sup>rd</sup> Street	B	15.3	B	15.3	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	E	57.1	E	57.1	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	19.4	B	19.4	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	127.6	<b>36.1</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	4.6	A	4.6	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	E	71.6	E	71.6	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	27.9	<b>7.1</b>	<b>Yes</b>
36	Grand Avenue / 5 <sup>th</sup> Street	E	58.5	E	58.5	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	E	61.6	E	61.6	0.0	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	98.4	F	98.4	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	D	38.4	<b>6.5</b>	<b>Yes</b>
40	Hope Street / 6 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	C	22.3	C	22.3	0.0	No

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
42	Olive Street / 6 <sup>th</sup> Street	C	31.8	C	31.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	F	206.8	F	206.8	0.0	No
44	Flower Street / Wilshire Blvd.	D	44.2	D	44.2	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	D	51.4	D	51.4	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	F	131.6	F	131.6	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	16.3	B	16.3	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	C	29.0	C	29.0	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	C	20.6	C	20.6	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	F	94.2	F	94.2	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	F	91.8	F	91.8	0.0	No
52	Hope Street / Temple Street	E	60.2	E	60.2	0.0	No
53	Grand Avenue / Temple Street	F	106.6	F	106.6	0.0	No
54	Hill Street / Temple Street	F	95.1	F	95.1	0.0	No
55	Broadway / Temple Street	E	69.1	E	69.1	0.0	No
56	Spring Street / Temple Street	B	18.6	B	18.6	0.0	No
57	Main Street / Temple Street	C	30.2	C	30.2	0.0	No
58	Los Angeles Street / Temple Street	C	32.7	C	32.7	0.0	No
59	Judge John Aiso Street / Temple Street	B	15.7	E	75.2	59.5	Yes

**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
60	Alameda Street / Temple Street	E	77.1	E	77.6	0.5	No
61	Los Angeles Street / Aliso Street	C	21.7	C	21.7	0.0	No
62	Alameda Street / Aliso Street	D	48.9	F	82.6	<b>33.7</b>	<b>Yes</b>
63	Los Angeles Street / Arcadia Street	B	16.3	B	16.3	0.0	No
64	Alameda Street / Arcadia Street	F	148.5	F	148.5	0.0	No
65-1	Alameda Street / Los Angeles Street N.	C	26.2	C	26.2	0.0	No
65-2	Alameda Street / Los Angeles Street S.	B	15.4	B	15.4	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	F	75.4	F	56.1	-19.3	No
67	Olive Street / 1 <sup>st</sup> Street	C	25.1	C	25.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	E	57.8	D	51.8	-6.0	No
69	S. Hope Street / 2 <sup>nd</sup> Street	C	32.0	C	27.4	-4.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	C	24.3	C	20.9	-3.4	No
71	Broadway / Arcadia Street	D	45.2	D	45.2	0.0	No
72	Spring Street / Arcadia Street	B	10.4	B	10.4	0.0	No
73	Main Street / Arcadia Street	B	15.6	B	15.6	0.0	No
74	Broadway / Aliso Street	C	21.9	C	21.9	0.0	No
75	Spring Street / Aliso Street	B	11.1	B	11.1	0.0	No



**Table 5-4. Year 2035 Underground Emphasis LRT Alternative:  
Intersection LOS and Impacts**

No.	Intersection	No Build		Underground Emphasis		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
76	Main Street / Aliso Street	B	16.5	B	16.5	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	D	45.4	D	45.4	0.0	No
78	Olive Street / 4 <sup>th</sup> Street	E	61.5	E	61.5	0.0	No
79	Broadway / 4 <sup>th</sup> Street	C	22.1	C	22.1	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	C	21.4	C	21.4	0.0	No
81	Main Street / 4 <sup>th</sup> Street	C	34.7	C	34.7	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	C	33.1	C	33.1	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	B	19.9	B	19.9	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	B	19.6	B	19.6	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	F	131.1	F	131.1	0.0	No

### 5.1.4.3 Parking

Portions of the Underground Emphasis LRT Alternative alignment would use existing roadway space for underground station pedestrian portals and a roadway underpass on Alameda Street. At these locations, there would be a reduction in traffic lanes and/or parking spaces. The number of parking and loading spaces that would be removed was estimated based on the characteristics of each street segment and the proposed street cross-sections. The expected impacts along each of the street segments that the alignment would traverse are discussed below.

*Flower Street*—Between 5<sup>th</sup> and 3<sup>rd</sup> Streets, seven of the 13 on-street parking spaces on the east side of the street between 5<sup>th</sup> and 4<sup>th</sup> Streets would be removed. Due to the relatively wide sidewalk, loading spaces on both the east and west sides of the streets would be maintained by creating a loading bay area.

*Alameda Street*— The proposed Alameda Street underpass at 1<sup>st</sup> Street would impact the segment of the street between Temple and 2<sup>nd</sup> Streets. In this segment, the three bus tour loading spaces on the west side of the street adjacent to the Japanese American National Museum would be eliminated. However, access to the JANM loading dock would be maintained. The 10 on-street parking spaces on the east side of the street would also be removed.

The parking impacts identified under this alternative would not be considered adverse or significant.

#### 5.1.4.4 Other Modes

For the Underground Emphasis LRT Alternative, the only street and intersection location where the LRT has an at-grade profile would be in the vicinity of Alameda Street at 1<sup>st</sup> Street. The alignment would utilize existing roadway space for tracks, underground station pedestrian portals, and a roadway underpass on Alameda Street. Urban design concepts may be incorporated at these locations to improve pedestrian and bicycle safety and flow.

The sidewalk along Flower Street between 6<sup>th</sup> and 3<sup>rd</sup> Streets and along 2<sup>nd</sup> Street at the underground station portals would be maintained or widened. No pedestrian impacts would be expected for these segments of the alignment. At station areas, portals would be located near major signalized intersections, where pedestrian crosswalks are currently in place. Where the tracks cross Alameda Street, a pedestrian bridge is proposed to reduce potential conflicts between pedestrians, trains, and automobiles.

The tunnel portal would be located in the lot bounded by 1<sup>st</sup> Street, Alameda Street, 2<sup>nd</sup> Street, and Central Avenue. Signing and surveillance would be utilized at this tunnel portal to reduce the possibility of unauthorized tunnel entry. Potentially significant pedestrian safety issues associated with unauthorized pedestrian crossings of the tracks at 1<sup>st</sup> and Alameda Streets would be addressed during design and use Metro standards to minimize possible conflicts. A pedestrian bridge could also be constructed between the 2<sup>nd</sup>/Hope Street station and Upper Grand Avenue to enhance the connection to Bunker Hill.

The underground alignment would not directly impact designated bicycle routes. However, the proposed underpass on Alameda Street at 1<sup>st</sup> Street and potential changes in traffic circulation patterns may result in the diversion of local traffic to adjacent roadway segments such as Central Avenue. Central Avenue is designated as a Class III bicycle route. Consequently, the flow of bicycle traffic may be impacted by increased traffic volumes on Central Avenue resulting from a potential localized shift in traffic. The impacts identified under this alternative would be less than significant.

Proposed stations would include bike lockers and racks, increasing the bicycle facilities in the area and creating a positive impact. In addition, pedestrian level lighting at stations would

improve the attractiveness and perception of safety, specifically in the evening hours, creating a positive effect for patrons and the community.

## 5.1.5 Fully Underground LRT Alternative – Little Tokyo Variation 1

### 5.1.5.1 Transit

The Fully Underground LRT Alternative - Little Tokyo Version 1 would include a complete underground light rail alignment linking the 7<sup>th</sup> Street/Metro Center Station and the Metro Gold Line at 1<sup>st</sup> and Alameda Streets. All of the provisions of the No Build Alternative would be included. This alternative is similar to the Underground Emphasis LRT Alternative except that an additional underground station would be located in the property to be acquired between 1<sup>st</sup>, 2<sup>nd</sup>, Central, and Alameda Streets; the rail lines would cross under the 1<sup>st</sup> and Alameda Streets intersection; and two portals would be constructed. The alignment would surface from one portal to the east of Alameda Street north of Temple Street, to connect to the Metro Gold Line bridge over the US 101 freeway to Union Station. The alignment also would surface from another portal to connect to the Metro Gold Line tracks to East Los Angeles on 1<sup>st</sup> Street east of Alameda Street.

This alternative would provide a direct east-west route between Santa Monica and the I-605 vicinity and a direct north-south route between the Cities of Azusa and Long Beach. Consequently, transit patrons could travel from east-west or north-south without having to make a transfer in the downtown area. The new underground station within the property bounded by 1<sup>st</sup>, 2<sup>nd</sup>, Central, and Alameda Streets would serve all operations.

For the Fully Underground LRT Alternative – Little Tokyo Variation 1, the total daily system wide linked transit trips for the entire bus and rail system are projected to be about 1,734,500, which would be a 17,400-trip increase over the No Build Alternative and a 12,100-trip increase over the TSM Alternative. The daily urban rail boarding count for this alternative is projected to be 282,700 at the Metro Blue Line, Metro Gold Line, Metro Expo Line, and the proposed Regional Connector stations combined. The projections show an increase of about 24,200 in urban rail boardings, which would be a positive impact of this alternative. The theoretical carrying capacity of the downtown LRT system would be approximately 13,000 passengers per hour in each direction.

Proposed traffic lane reductions along Flower Street, due to the underground station pedestrian portals, would impact bus operating speeds because of a potential increase in traffic congestion. Bus schedules would be adjusted to reflect modified traffic conditions and travel times. However, from an urban rail perspective, this alternative represents a significant positive impact when compared to both the No Build and TSM Alternatives. In summary, the potential transit impacts identified under this alternative would be less than significant.

### 5.1.5.2 Traffic Circulation

The Fully Underground Alternative - Little Tokyo Variation 1 would be completely below ground. To accommodate underground station pedestrian portals, one traffic lane would be removed on Flower Street between 6<sup>th</sup> and 4<sup>th</sup> Streets. After construction of the train portals east of Alameda Street and on 1<sup>st</sup> Street, existing traffic lanes would be maintained; however, the signalized intersection at 1<sup>st</sup> and Hewitt Streets would be removed, eliminating the ability to cross 1<sup>st</sup> Street at that location. No at-grade train operations would pass through the two intersections of 1<sup>st</sup> and Alameda Streets and 1<sup>st</sup> and Temple Streets and traffic signals would operate under that assumption.

The results of the traffic analysis for this alternative and resulting predicted AM and PM peak hour levels of service are presented in Table 5-5. In addition, the table highlights in bold the intersections that would exceed the significance threshold and would be expected to be significantly impacted by this alternative.

The results indicate that under the Fully Underground LRT Alternative – Little Tokyo Variation 1, 70 intersections would continue to operate at LOS D or better in the AM peak hour and 68 would continue to operate at LOS D or better in the PM peak hour. In the AM peak hour, seven intersections would operate at LOS E and eight would operate at LOS F. In the PM peak hour these numbers increase to 13 intersections operating at LOS E and 14 operating at LOS F. Many of these intersections would operate at the same level of service as projected for the No Build Alternative.

Intersections that would be impacted include those that are projected to have a significant negative change in LOS when compared to the No Build Alternative conditions. As defined in Section 3.1, the significance of an impact is related to the magnitude in the change in delay. Only one intersection during the AM peak hour and only three intersections during the PM peak hour would experience a significant adverse impact from the Fully Underground LRT Alternative – Little Tokyo Variation 1.

Table 5-5 also shows that a number of intersections would improve over the No Build Alternative by virtue of a reduction in delays. During the AM peak hour, four intersections would have delay improvements and seven intersections would experience improvements in delay during the PM peak hour. This alternative would increase the person-carrying capacity through the downtown transportation environment without adversely impacting traffic operations.

In summary, the traffic circulation impacts identified under this alternative would be significant.

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	65.3	E	65.3	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	C	24.1	C	24.1	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	24.0	C	24.0	0.0	No
4	Spring Street / 1 <sup>st</sup> Street	B	17.3	B	17.3	0.0	No
5	Main Street / 1 <sup>st</sup> Street	B	16.5	B	16.5	0.0	No
6	Los Angeles Street / 1 <sup>st</sup> Street	B	16.6	B	16.6	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	B	13.9	B	13.9	0.0	No
8	Central Avenue / 1 <sup>st</sup> Street	A	5.8	A	5.8	0.0	No
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	C	24.6	-19.8	No
10	Figueroa Street / 2 <sup>nd</sup> Street	C	25.8	C	25.8	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	13.6	B	13.6	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.7	B	19.7	0.0	No
13	Broadway / 2 <sup>nd</sup> Street	B	18.4	B	18.4	0.0	No
14	Spring Street / 2 <sup>nd</sup> Street	C	25.3	C	25.3	0.0	No
15	Main Street / 2 <sup>nd</sup> Street	B	12.9	B	12.9	0.0	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	14.8	B	14.8	0.0	No
17	San Pedro Street / 2 <sup>nd</sup> Street	B	14.5	B	14.5	0.0	No
18	Central Avenue / 2 <sup>nd</sup> Street	A	9.9	A	9.9	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
19	Alameda Street / 2 <sup>nd</sup> Street	B	15.9	B	15.9	0.0	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	98.5	F	98.5	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	C	28.4	C	28.4	0.0	No
22	Grand Avenue / 3 <sup>rd</sup> Street	A	9.6	A	9.6	0.0	No
23	Hill Street / 3 <sup>rd</sup> Street	E	58.7	E	58.7	0.0	No
24	Broadway / 3 <sup>rd</sup> Street	F	86.9	F	86.9	0.0	No
25	Spring Street / 3 <sup>rd</sup> Street	F	87.8	F	87.8	0.0	No
26	Main Street / 3 <sup>rd</sup> Street	C	22.7	C	22.7	0.0	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	67.1	E	67.1	0.0	No
28	San Pedro Street / 3 <sup>rd</sup> Street	C	23.7	C	23.7	0.0	No
29	Central Avenue / 3 <sup>rd</sup> Street	C	25.2	C	25.2	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	F	82.9	F	82.9	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	18.0	B	18.0	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	F	102.9	<b>63.3</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	3.0	A	3.0	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	B	16.5	B	16.5	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	27.1	4.8	No
36	Grand Avenue / 5 <sup>th</sup> Street	C	21.8	C	21.8	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	C	20.8	C	20.8	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
38	Figueroa Street / 6 <sup>th</sup> Street	F	104.0	F	104.0	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	D	36.1	3.5	No
40	Hope Street / 6 <sup>th</sup> Street	A	7.3	A	7.3	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	B	16.4	B	16.4	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	B	18.8	B	18.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	E	61.6	E	61.6	0.0	No
44	Flower Street / Wilshire Blvd.	D	41.0	D	41.0	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	C	24.8	C	24.8	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	B	13.8	B	13.8	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	10.7	B	10.7	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	B	16.6	B	16.6	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
52	Hope Street / Temple Street	D	36.5	D	36.5	0.0	No
53	Grand Avenue / Temple Street	F	94.4	F	94.4	0.0	No
54	Hill Street / Temple Street	D	35.2	D	35.2	0.0	No
55	Broadway / Temple Street	E	70.1	E	70.1	0.0	No
56	Spring Street / Temple Street	C	27.5	C	27.5	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
57	Main Street / Temple Street	B	11.4	B	11.4	0.0	No
58	Los Angeles Street / Temple Street	B	19.7	B	19.7	0.0	No
59	Judge John Aiso Street / Temple Street	A	5.6	A	5.6	0.0	No
60	Alameda Street / Temple Street	C	29.9	C	20.7	-9.2	No
61	Los Angeles Street / Aliso Street	B	12.9	B	12.9	0.0	No
62	Alameda Street / Aliso Street	F	88.5	F	88.5	0.0	No
63	Los Angeles Street / Arcadia Street	B	14.4	B	14.4	0.0	No
64	Alameda Street / Arcadia Street	E	64.7	E	64.7	0.0	No
65-1	Alameda Street / Los Angeles Street N.	D	40.4	D	40.4	0.0	No
65-2	Alameda Street / Los Angeles Street S.	A	6.5	A	6.5	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	A	5.7	A	5.7	0.0	No
67	Olive Street / 1 <sup>st</sup> Street	B	16.1	B	16.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	F	99.7	E	69.0	-30.7	No
69	S. Hope Street / 2 <sup>nd</sup> Street	A	7.5	B	11.1	3.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	B	18.2	A	7.2	-11.0	No
71	Broadway / Arcadia Street	B	12.8	B	12.8	0.0	No
72	Spring Street / Arcadia Street	B	16.3	B	16.3	0.0	No



**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
73	Main Street / Arcadia Street	A	9.4	A	9.4	0.0	No
74	Broadway / Aliso Street	B	19.6	B	19.6	0.0	No
75	Spring Street / Aliso Street	B	11.4	B	11.4	0.0	No
76	Main Street / Aliso Street	A	6.8	A	6.8	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	B	18.3	B	18.3	0.0	No
78	Olive Street / 4 <sup>th</sup> Street	B	17.0	B	17.0	0.0	No
79	Broadway / 4 <sup>th</sup> Street	B	14.8	B	14.8	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
81	Main Street / 4 <sup>th</sup> Street	B	11.8	B	11.8	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	B	10.6	B	10.6	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	A	8.1	A	8.1	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	A	8.2	A	8.2	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	B	12.0	B	12.0	0.0	No
<b>PM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	56.2	E	56.2	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	E	67.2	E	67.2	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	30.5	C	30.5	0.0	No
4	Spring Street / 1 <sup>st</sup> Street	B	15.7	B	15.7	0.0	No
5	Main Street / 1 <sup>st</sup> Street	D	53.0	D	53.0	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
6	Los Angeles Street / 1 <sup>st</sup> Street	F	102.9	F	102.9	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	C	21.1	C	21.1	0.0	No
8	Central Avenue / 1 <sup>st</sup> Street	B	14.1	B	14.1	0.0	No
9	Alameda Street / 1 <sup>st</sup> Street	F	97.6	E	74.4	-23.2	No
10	Figueroa Street / 2 <sup>nd</sup> Street	F	120.7	F	120.7	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	16.7	B	16.7	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.9	B	19.9	0.0	No
13	Broadway / 2 <sup>nd</sup> Street	C	20.6	C	20.6	0.0	No
14	Spring Street / 2 <sup>nd</sup> Street	B	14.5	B	14.5	0.0	No
15	Main Street / 2 <sup>nd</sup> Street	C	33.9	C	33.9	0.0	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	C	34.4	C	34.4	0.0	No
17	San Pedro Street / 2 <sup>nd</sup> Street	B	19.1	B	19.1	0.0	No
18	Central Avenue / 2 <sup>nd</sup> Street	B	10.2	B	10.2	0.0	No
19	Alameda Street / 2 <sup>nd</sup> Street	C	33.1	C	33.1	0.0	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	140.9	F	140.9	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	B	15.7	B	15.5	-0.2	No
22	Grand Avenue / 3 <sup>rd</sup> Street	B	13.3	B	13.3	0.0	No
23	Hill Street / 3 <sup>rd</sup> Street	D	48.5	D	48.5	0.0	No
24	Broadway / 3 <sup>rd</sup> Street	E	65.7	E	65.7	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
25	Spring Street / 3 <sup>rd</sup> Street	E	55.9	E	55.9	0.0	No
26	Main Street / 3 <sup>rd</sup> Street	D	39.1	D	39.1	0.0	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	C	23.9	C	23.9	0.0	No
28	San Pedro Street / 3 <sup>rd</sup> Street	B	13.9	B	13.9	0.0	No
29	Central Avenue / 3 <sup>rd</sup> Street	B	15.3	B	15.3	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	E	57.1	E	57.1	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	19.4	B	19.4	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	127.6	<b>36.1</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	4.6	A	4.6	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	E	71.6	E	71.6	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	27.9	<b>7.1</b>	<b>Yes</b>
36	Grand Avenue / 5 <sup>th</sup> Street	E	58.5	E	58.5	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	E	61.6	E	61.6	0.0	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	98.4	F	98.4	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	D	38.4	<b>6.5</b>	<b>Yes</b>
40	Hope Street / 6 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	C	22.3	C	22.3	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	C	31.8	C	31.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	F	206.8	F	206.8	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
44	Flower Street / Wilshire Blvd.	D	44.2	D	44.2	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	D	51.4	D	51.4	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	F	131.6	F	131.6	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	16.3	B	16.3	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	C	29.0	C	29.0	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	C	20.6	C	20.6	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	F	94.2	F	94.2	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	F	91.8	F	91.8	0.0	No
52	Hope Street / Temple Street	E	60.2	E	60.2	0.0	No
53	Grand Avenue / Temple Street	F	106.6	F	106.6	0.0	No
54	Hill Street / Temple Street	F	95.1	F	95.1	0.0	No
55	Broadway / Temple Street	E	69.1	E	69.1	0.0	No
56	Spring Street / Temple Street	B	18.6	B	18.6	0.0	No
57	Main Street / Temple Street	C	30.2	C	30.2	0.0	No
58	Los Angeles Street / Temple Street	C	32.7	C	32.7	0.0	No
59	Judge John Aiso Street / Temple Street	B	15.7	B	15.7	0.0	No
60	Alameda Street / Temple Street	E	77.1	E	63.3	-13.8	No
61	Los Angeles Street / Aliso Street	C	21.7	C	21.7	0.0	No
62	Alameda Street / Aliso Street	D	48.9	D	48.9	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
63	Los Angeles Street / Arcadia Street	B	16.3	B	16.3	0.0	No
64	Alameda Street / Arcadia Street	F	148.5	F	148.5	0.0	No
65-1	Alameda Street / Los Angeles Street N.	C	26.2	C	26.2	0.0	No
65-2	Alameda Street / Los Angeles Street S.	B	15.4	B	15.4	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	F	75.4	F	56.1	-19.3	No
67	Olive Street / 1 <sup>st</sup> Street	C	25.1	C	25.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	E	57.8	D	51.8	-6.0	No
69	S. Hope Street / 2 <sup>nd</sup> Street	C	32.0	C	27.4	-4.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	C	24.3	C	20.9	-3.4	No
71	Broadway / Arcadia Street	D	45.2	D	45.2	0.0	No
72	Spring Street / Arcadia Street	B	10.4	B	10.4	0.0	No
73	Main Street / Arcadia Street	B	15.6	B	15.6	0.0	No
74	Broadway / Aliso Street	C	21.9	C	21.9	0.0	No
75	Spring Street / Aliso Street	B	11.1	B	11.1	0.0	No
76	Main Street / Aliso Street	B	16.5	B	16.5	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	D	45.4	D	45.4	0.0	No
78	Olive Street / 4 <sup>th</sup> Street	E	61.5	E	61.5	0.0	No

**Table 5-5. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 1: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
79	Broadway / 4 <sup>th</sup> Street	C	22.1	C	22.1	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	C	21.4	C	21.4	0.0	No
81	Main Street / 4 <sup>th</sup> Street	C	34.7	C	34.7	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	C	33.1	C	33.1	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	B	19.9	B	19.9	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	B	19.6	B	19.6	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	F	131.1	F	131.1	0.0	No

### 5.1.5.3 Parking

The Fully Underground LRT Alternative - Little Tokyo Version 1 would be entirely underground; however, portions of the alignment would utilize existing roadway space for underground station pedestrian portals. At these locations, there would be a reduction in traffic lanes and/or parking spaces along the street segments. The number of parking and loading spaces that would be removed was estimated based on the characteristics of each street segment and the proposed street cross-sections. The potential impacts along each of the street segments that the alignment would traverse are discussed below.

*Flower Street* - Between 5<sup>th</sup> and 3<sup>rd</sup> Streets, seven of the 13 on-street parking spaces on the east side of the street between 5<sup>th</sup> and 4<sup>th</sup> Streets would be removed. Due to the relatively wide sidewalk, the loading spaces on both the east and west sides of the street would be maintained by creating a loading bay area.

The parking impacts identified under this alternative would not be considered adverse or significant. No NEPA, CEQA, or local thresholds for the significance of displaced parking are available. Only seven parking spaces would be displaced, in an area with multiple off-street garages. Also, the parking spaces would be replaced by a new underground light rail station, and the improved transit access would offset the effects of the lost parking. Therefore, the parking impacts would not be significant.

#### 5.1.5.4 Other Modes

Although this alternative would be entirely underground, portions of the alignment would use existing roadway space for underground station pedestrian portals. At these locations, urban design concepts may be incorporated to improve pedestrian and bicycle safety and flow. This alternative would have no impacts on bicycle facilities located within the project area.

The sidewalk along Flower Street between 6<sup>th</sup> and 3<sup>rd</sup> Streets and along 2<sup>nd</sup> Street at the underground station portals would be maintained or widened. No pedestrian impacts would be expected for these segments of the alignment. At station areas, portals would be located near major signalized intersections where pedestrian crosswalks are currently in place. A pedestrian bridge could also be constructed between the 2<sup>nd</sup>/Hope Street station and Upper Grand Avenue to enhance the connection to Bunker Hill. Potential pedestrian impacts identified under this alternative would be less than significant.

Proposed stations would be equipped with bike lockers and racks, increasing the bicycle facilities in the area and creating a positive impact. In addition, pedestrian level lighting at stations would improve the attractiveness and perception of safety, specifically in the evening hours, potentially creating a positive effect for patrons and the community.

### 5.1.6 Fully Underground LRT Alternative – Little Tokyo Variation 2

#### 5.1.6.1 Transit

From an operational point of view, the Fully Underground LRT Alternative – Little Tokyo Variation 2 is similar to the Fully Underground LRT Alternative - Little Tokyo Variation 1 and would include a complete underground light rail alignment linking the 7<sup>th</sup> Street/Metro Center Station and the Metro Gold Line at 1<sup>st</sup> and Alameda Streets. All of the provisions of the No Build Alternative would be included. This alternative would also include four underground stations located near Flower/4<sup>th</sup>/5<sup>th</sup> Streets, 2<sup>nd</sup>/Hope Streets, 2<sup>nd</sup> Street/Broadway, and one in the property to be acquired between 1<sup>st</sup>, 2<sup>nd</sup>, Central, and Alameda Streets. The rail lines would cross under the intersection of 1<sup>st</sup> and Alameda Streets in a new two-level junction configuration.

Three new portals would be constructed under this alternative. The alignment would surface from one portal east of Alameda Street and north of Temple Street to connect to the Metro Gold Line bridge over the US 101 freeway to Union Station. The alignment would also surface in 1<sup>st</sup> Street to connect to the Metro Gold Line tract to East Los Angeles. The alignment would surface from two portals instead of one, each containing one track, within the widened median of 1<sup>st</sup> Street. The portal containing the westbound track would be located between Alameda and Garey Streets. The portal containing the eastbound track would be located adjacent to the westbound track between Hewitt and Vignes Streets.

This alternative would provide a direct east-west route between Santa Monica and the vicinity of I-605 and a direct north-south route between the Cities of Azusa and Long Beach. Consequently, transit patrons could travel from east-west or north-south without having to transfer in the downtown area. The new two-level underground station within the property bounded by 1<sup>st</sup>, 2<sup>nd</sup>, Central and Alameda Streets would serve all operations.

For the Fully Underground LRT Alternative – Little Tokyo Variation 2, the total daily system wide linked transit trips for the entire bus and rail system is projected to be about 1,734,500, which would be a 17,400-trip increase over the No Build Alternative and a 12,100-trip increase over the TSM Alternative. The daily urban rail boarding count for this alternative is projected to be 282,700 at the Metro Blue Line, Metro Gold Line, Metro Expo Line, and the proposed new Regional Connector stations combined. The projections show an increase of about 24,200 in urban rail boardings, which would be a positive impact of this alternative. The theoretical carrying capacity of the downtown LRT system would be approximately 13,000 passengers per hour in each direction.

Proposed traffic lane reductions along Flower Street would impact bus operating speeds because of the potential increase in traffic congestion. Bus schedules would be adjusted to reflect modified traffic conditions and travel times. However, from an urban rail perspective, this alternative would represent a significant positive impact when compared to both the No Build and TSM Alternatives. In summary, the transit impacts identified under this alternative would be less than significant.

#### 5.1.6.2 Traffic Circulation

The Fully Underground LRT Alternative - Little Tokyo Variation 2 would be completely below ground. One traffic lane would be removed on Flower Street between 6<sup>th</sup> and 4<sup>th</sup> Streets to accommodate the underground station pedestrian portals. After construction of the train portals on Alameda and 1<sup>st</sup> Streets, the existing traffic lanes would be maintained. However, the signalized intersection at 1<sup>st</sup> and Hewitt Streets would be removed, eliminating the ability to cross 1<sup>st</sup> Street at that location. Traffic signals at the intersections of 1<sup>st</sup> and Alameda Streets and 1<sup>st</sup> and Temple Streets would operate under the assumption that no at-grade train operations would pass through these two intersections.

From an operational perspective, the traffic analysis for this alternative results in the same effects as the Fully Underground LRT Alternative - Little Tokyo Variation 1. The predicted AM and PM peak hour levels of service are presented in Table 5-6. In addition, the table highlights in bold the intersections that would exceed the significance threshold and that would be significantly impacted due to the Fully Underground LRT Alternative – Little Tokyo Variation 2.

The results indicate that under the Fully Underground LRT Alternative – Little Tokyo Variation 2, 70 intersections would continue to operate at LOS D or better in the AM peak hour and 68



would continue to operate at LOS D or better during the PM peak hour. In the AM peak hour, seven intersections would operate at LOS E and eight would operate at LOS F. In the PM peak hour, these numbers increase to 13 intersections operating at LOS E and 14 operating at LOS F. Many of these intersections would operate at the same level of service as projected for the No Build Alternative.

Intersections that would be impacted include those that are projected to have a significant negative change in LOS when compared to the No Build Alternative conditions. As defined in Section 3.1, the significance of an impact is related to the magnitude in the change in delay. Only one intersection during the AM peak hour and only three intersections during the PM peak hour would experience a significant adverse impact under the Fully Underground LRT Alternative – Little Tokyo Variation 2.

Table 5-6 also shows that a number of intersections would improve over the No Build Alternative by virtue of a reduction in delays. Four intersections show delay improvements during the AM peak hour and seven show improvements in delays during the PM peak hour. This alternative would increase the person-carrying capacity through the downtown transportation environment without adversely impacting traffic operations.

In summary, the traffic circulation impacts identified under this alternative would be significant.

### 5.1.6.3 Parking

The Fully Underground LRT Alternative - Little Tokyo Version 2 would be entirely underground; however, portions of the alignment would use existing roadway space for underground station pedestrian portals. At these locations, traffic lanes and/or parking spaces may be reduced along the street segments. The number of parking and loading spaces that would be removed was estimated based on the characteristics of each street segment and the proposed street cross-sections. The expected impacts along each of the street segments that the alignment would traverse are discussed below.

*Flower Street*—Between 5<sup>th</sup> and 3<sup>rd</sup> Streets, seven of the 13 on-street parking spaces on the east side of the street between 5<sup>th</sup> and 4<sup>th</sup> Streets would be removed. Due to the relatively wide sidewalk, loading spaces on both the east and west sides of the streets would be maintained by creating a loading bay area.

The parking impacts identified under this alternative would not be considered adverse or significant. No NEPA, CEQA, or local thresholds for the significance of displaced parking or available. Only seven parking spaces would be displaced, in an area with multiple off-street garages. Also, the parking spaces would be replaced by a new underground light rail station, and the improved transit access would offset the effects of the lost parking. Therefore, the parking impacts would not be significant.

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	65.3	E	65.3	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	C	24.1	C	24.1	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	24.0	C	24.0	0.0	No
4	Spring Street / 1 <sup>st</sup> Street	B	17.3	B	17.3	0.0	No
5	Main Street / 1 <sup>st</sup> Street	B	16.5	B	16.5	0.0	No
6	Los Angeles Street / 1 <sup>st</sup> Street	B	16.6	B	16.6	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	B	13.9	B	13.9	0.0	No
8	Central Avenue / 1 <sup>st</sup> Street	A	5.8	A	5.8	0.0	No
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	C	24.6	-19.8	No
10	Figueroa Street / 2 <sup>nd</sup> Street	C	25.8	C	25.8	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	13.6	B	13.6	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.7	B	19.7	0.0	No
13	Broadway / 2 <sup>nd</sup> Street	B	18.4	B	18.4	0.0	No
14	Spring Street / 2 <sup>nd</sup> Street	C	25.3	C	25.3	0.0	No
15	Main Street / 2 <sup>nd</sup> Street	B	12.9	B	12.9	0.0	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	14.8	B	14.8	0.0	No
17	San Pedro Street / 2 <sup>nd</sup> Street	B	14.5	B	14.5	0.0	No
18	Central Avenue / 2 <sup>nd</sup> Street	A	9.9	A	9.9	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
19	Alameda Street / 2 <sup>nd</sup> Street	B	15.9	B	15.9	0.0	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	98.5	F	98.5	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	C	28.4	C	28.4	0.0	No
22	Grand Avenue / 3 <sup>rd</sup> Street	A	9.6	A	9.6	0.0	No
23	Hill Street / 3 <sup>rd</sup> Street	E	58.7	E	58.7	0.0	No
24	Broadway / 3 <sup>rd</sup> Street	F	86.9	F	86.9	0.0	No
25	Spring Street / 3 <sup>rd</sup> Street	F	87.8	F	87.8	0.0	No
26	Main Street / 3 <sup>rd</sup> Street	C	22.7	C	22.7	0.0	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	67.1	E	67.1	0.0	No
28	San Pedro Street / 3 <sup>rd</sup> Street	C	23.7	C	23.7	0.0	No
29	Central Avenue / 3 <sup>rd</sup> Street	C	25.2	C	25.2	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	F	82.9	F	82.9	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	18.0	B	18.0	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	F	102.9	<b>63.3</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	3.0	A	3.0	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	B	16.5	B	16.5	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	27.1	4.8	No
36	Grand Avenue / 5 <sup>th</sup> Street	C	21.8	C	21.8	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	C	20.8	C	20.8	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
38	Figueroa Street / 6 <sup>th</sup> Street	F	104.0	F	104.0	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	D	36.1	3.5	No
40	Hope Street / 6 <sup>th</sup> Street	A	7.3	A	7.3	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	B	16.4	B	16.4	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	B	18.8	B	18.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	E	61.6	E	61.6	0.0	No
44	Flower Street / Wilshire Blvd.	D	41.0	D	41.0	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	C	24.8	C	24.8	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	B	13.8	B	13.8	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	10.7	B	10.7	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	B	16.6	B	16.6	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
52	Hope Street / Temple Street	D	36.5	D	36.5	0.0	No
53	Grand Avenue / Temple Street	F	94.4	F	94.4	0.0	No
54	Hill Street / Temple Street	D	35.2	D	35.2	0.0	No
55	Broadway / Temple Street	E	70.1	E	70.1	0.0	No
56	Spring Street / Temple Street	C	27.5	C	27.5	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
57	Main Street / Temple Street	B	11.4	B	11.4	0.0	No
58	Los Angeles Street / Temple Street	B	19.7	B	19.7	0.0	No
59	Judge John Aiso Street / Temple Street	A	5.6	A	5.6	0.0	No
60	Alameda Street / Temple Street	C	29.9	C	20.7	-9.2	No
61	Los Angeles Street / Aliso Street	B	12.9	B	12.9	0.0	No
62	Alameda Street / Aliso Street	F	88.5	F	88.5	0.0	No
63	Los Angeles Street / Arcadia Street	B	14.4	B	14.4	0.0	No
64	Alameda Street / Arcadia Street	E	64.7	E	64.7	0.0	No
65-1	Alameda Street / Los Angeles Street N.	D	40.4	D	40.4	0.0	No
65-2	Alameda Street / Los Angeles Street S.	A	6.5	A	6.5	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	A	5.7	A	5.7	0.0	No
67	Olive Street / 1 <sup>st</sup> Street	B	16.1	B	16.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	F	99.7	E	69.0	-30.7	No
69	S. Hope Street / 2 <sup>nd</sup> Street	A	7.5	B	11.1	3.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	B	18.2	A	7.2	-11.0	No
71	Broadway / Arcadia Street	B	12.8	B	12.8	0.0	No
72	Spring Street / Arcadia Street	B	16.3	B	16.3	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
73	Main Street / Arcadia Street	A	9.4	A	9.4	0.0	No
74	Broadway / Aliso Street	B	19.6	B	19.6	0.0	No
75	Spring Street / Aliso Street	B	11.4	B	11.4	0.0	No
76	Main Street / Aliso Street	A	6.8	A	6.8	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	B	18.3	B	18.3	0.0	No
78	Olive Street / 4 <sup>th</sup> Street	B	17.0	B	17.0	0.0	No
79	Broadway / 4 <sup>th</sup> Street	B	14.8	B	14.8	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	B	13.9	B	13.9	0.0	No
81	Main Street / 4 <sup>th</sup> Street	B	11.8	B	11.8	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	B	10.6	B	10.6	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	A	8.1	A	8.1	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	A	8.2	A	8.2	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	B	12.0	B	12.0	0.0	No
<b>PM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	56.2	E	56.2	0.0	No
2	Hill Street / 1 <sup>st</sup> Street	E	67.2	E	67.2	0.0	No
3	Broadway / 1 <sup>st</sup> Street	C	30.5	C	30.5	0.0	No
4	Spring Street / 1 <sup>st</sup> Street	B	15.7	B	15.7	0.0	No
5	Main Street / 1 <sup>st</sup> Street	D	53.0	D	53.0	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
6	Los Angeles Street / 1 <sup>st</sup> Street	F	102.9	F	102.9	0.0	No
7	Judge John Aiso Street / 1 <sup>st</sup> Street	C	21.1	C	21.1	0.0	No
8	Central Avenue / 1 <sup>st</sup> Street	B	14.1	B	14.1	0.0	No
9	Alameda Street / 1 <sup>st</sup> Street	F	97.6	E	74.4	-23.2	No
10	Figueroa Street / 2 <sup>nd</sup> Street	F	120.7	F	120.7	0.0	No
11	Grand Avenue / 2 <sup>nd</sup> Street	B	16.7	B	16.7	0.0	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.9	B	19.9	0.0	No
13	Broadway / 2 <sup>nd</sup> Street	C	20.6	C	20.6	0.0	No
14	Spring Street / 2 <sup>nd</sup> Street	B	14.5	B	14.5	0.0	No
15	Main Street / 2 <sup>nd</sup> Street	C	33.9	C	33.9	0.0	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	C	34.4	C	34.4	0.0	No
17	San Pedro Street / 2 <sup>nd</sup> Street	B	19.1	B	19.1	0.0	No
18	Central Avenue / 2 <sup>nd</sup> Street	B	10.2	B	10.2	0.0	No
19	Alameda Street / 2 <sup>nd</sup> Street	C	33.1	C	33.1	0.0	No
20	Figueroa Street / 3 <sup>rd</sup> Street	F	140.9	F	140.9	0.0	No
21	Flower Street / 3 <sup>rd</sup> Street	B	15.7	B	15.5	-0.2	No
22	Grand Avenue / 3 <sup>rd</sup> Street	B	13.3	B	13.3	0.0	No
23	Hill Street / 3 <sup>rd</sup> Street	D	48.5	D	48.5	0.0	No
24	Broadway / 3 <sup>rd</sup> Street	E	65.7	E	65.7	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
25	Spring Street / 3 <sup>rd</sup> Street	E	55.9	E	55.9	0.0	No
26	Main Street / 3 <sup>rd</sup> Street	D	39.1	D	39.1	0.0	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	C	23.9	C	23.9	0.0	No
28	San Pedro Street / 3 <sup>rd</sup> Street	B	13.9	B	13.9	0.0	No
29	Central Avenue / 3 <sup>rd</sup> Street	B	15.3	B	15.3	0.0	No
30	Alameda Street / 3 <sup>rd</sup> Street	E	57.1	E	57.1	0.0	No
31	Figueroa Street / 4 <sup>th</sup> Street	B	19.4	B	19.4	0.0	No
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	127.6	<b>36.1</b>	<b>Yes</b>
33	Grand Avenue / 4 <sup>th</sup> Street	A	4.6	A	4.6	0.0	No
34	Figueroa Street / 5 <sup>th</sup> Street	E	71.6	E	71.6	0.0	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	27.9	<b>7.1</b>	<b>Yes</b>
36	Grand Avenue / 5 <sup>th</sup> Street	E	58.5	E	58.5	0.0	No
37	Olive Street / 5 <sup>th</sup> Street	E	61.6	E	61.6	0.0	No
38	Figueroa Street / 6 <sup>th</sup> Street	F	98.4	F	98.4	0.0	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	D	38.4	<b>6.5</b>	<b>Yes</b>
40	Hope Street / 6 <sup>th</sup> Street	B	16.2	B	16.2	0.0	No
41	Grand Avenue / 6 <sup>th</sup> Street	C	22.3	C	22.3	0.0	No
42	Olive Street / 6 <sup>th</sup> Street	C	31.8	C	31.8	0.0	No
43	Figueroa Street / Wilshire Blvd.	F	206.8	F	206.8	0.0	No



**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
44	Flower Street / Wilshire Blvd.	D	44.2	D	44.2	0.0	No
45	Figueroa Street / 7 <sup>th</sup> Street	D	51.4	D	51.4	0.0	No
46	Flower Street / 7 <sup>th</sup> Street	F	131.6	F	131.6	0.0	No
47	Hope Street / 7 <sup>th</sup> Street	B	16.3	B	16.3	0.0	No
48	Grand Avenue / 7 <sup>th</sup> Street	C	29.0	C	29.0	0.0	No
49	Olive Street / 7 <sup>th</sup> Street	C	20.6	C	20.6	0.0	No
50	Figueroa Street / 8 <sup>th</sup> Street	F	94.2	F	94.2	0.0	No
51	Flower Street / 8 <sup>th</sup> Street	F	91.8	F	91.8	0.0	No
52	Hope Street / Temple Street	E	60.2	E	60.2	0.0	No
53	Grand Avenue / Temple Street	F	106.6	F	106.6	0.0	No
54	Hill Street / Temple Street	F	95.1	F	95.1	0.0	No
55	Broadway / Temple Street	E	69.1	E	69.1	0.0	No
56	Spring Street / Temple Street	B	18.6	B	18.6	0.0	No
57	Main Street / Temple Street	C	30.2	C	30.2	0.0	No
58	Los Angeles Street / Temple Street	C	32.7	C	32.7	0.0	No
59	Judge John Aiso Street / Temple Street	B	15.7	B	15.7	0.0	No
60	Alameda Street / Temple Street	E	77.1	E	63.3	-13.8	No
61	Los Angeles Street / Aliso Street	C	21.7	C	21.7	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
62	Alameda Street / Aliso Street	D	48.9	D	48.9	0.0	No
63	Los Angeles Street / Arcadia Street	B	16.3	B	16.3	0.0	No
64	Alameda Street / Arcadia Street	F	148.5	F	148.5	0.0	No
65-1	Alameda Street / Los Angeles Street N.	C	26.2	C	26.2	0.0	No
65-2	Alameda Street / Los Angeles Street S.	B	15.4	B	15.4	0.0	No
66	Dewap Rd. / 1 <sup>st</sup> Street	F	75.4	F	56.1	-19.3	No
67	Olive Street / 1 <sup>st</sup> Street	C	25.1	C	25.1	0.0	No
68	Hope Street / 1 <sup>st</sup> Street	E	57.8	D	51.8	-6.0	No
69	S. Hope Street / 2 <sup>nd</sup> Street	C	32.0	C	27.4	-4.6	No
70	S. Hope Street / Gen. Thaddeus Kosciuszko Way	C	24.3	C	20.9	-3.4	No
71	Broadway / Arcadia Street	D	45.2	D	45.2	0.0	No
72	Spring Street / Arcadia Street	B	10.4	B	10.4	0.0	No
73	Main Street / Arcadia Street	B	15.6	B	15.6	0.0	No
74	Broadway / Aliso Street	C	21.9	C	21.9	0.0	No
75	Spring Street / Aliso Street	B	11.1	B	11.1	0.0	No
76	Main Street / Aliso Street	B	16.5	B	16.5	0.0	No
77	Hill Street / 4 <sup>th</sup> Street	D	45.4	D	45.4	0.0	No

**Table 5-6. Year 2035 Fully Underground LRT Alternative –  
Little Tokyo Variation 2: Intersection LOS and Impacts**

No.	Intersection	No Build		Fully Underground		Change in Delay	Significant Impact
		LOS	Delay	LOS	Delay		
78	Olive Street / 4 <sup>th</sup> Street	E	61.5	E	61.5	0.0	No
79	Broadway / 4 <sup>th</sup> Street	C	22.1	C	22.1	0.0	No
80	Spring Street / 4 <sup>th</sup> Street	C	21.4	C	21.4	0.0	No
81	Main Street / 4 <sup>th</sup> Street	C	34.7	C	34.7	0.0	No
82	Los Angeles Street / 4 <sup>th</sup> Street	C	33.1	C	33.1	0.0	No
83	San Pedro Street / 4 <sup>th</sup> Street	B	19.9	B	19.9	0.0	No
84	Central Avenue / 4 <sup>th</sup> Street	B	19.6	B	19.6	0.0	No
85	Alameda Street / 4 <sup>th</sup> Street	F	131.1	F	131.1	0.0	No

#### 5.1.6.4 Other Modes

The Fully Underground LRT Alternative - Little Tokyo Version 2 would be entirely underground; however, portions of the alignment would utilize existing roadway space for underground station pedestrian portals. At these locations, urban design concepts may be incorporated to improve pedestrian and bicycle safety and flow. This alternative would have no impacts on bicycle facilities located within the project area.

The sidewalk along Flower Street between 6<sup>th</sup> and 3<sup>rd</sup> Streets and along 2<sup>nd</sup> Street at the underground station portals would be maintained or widened. No pedestrian impacts are expected for these segments of the alignment. At station areas, the portals would be located near major signalized intersections where pedestrian crosswalks are currently in place. A pedestrian bridge could also be constructed between the 2<sup>nd</sup>/Hope Street station and Upper Grand Avenue to enhance the connection to Bunker Hill. Potential pedestrian impacts from this alternative would be less than significant.

Proposed stations would be equipped with bike lockers and racks, increasing the bicycle facilities in the area and creating a positive impact. In addition, pedestrian level lighting at

stations would improve the attractiveness and perception of safety, specifically in the evening hours, creating a positive effect for patrons and the community.

## 5.2 Construction Impacts

Analysis of potential transportation-related construction impacts was based on proposed construction staging scenarios. Potential adverse impacts that may occur during construction of each alternative were evaluated. Implementation of the No Build or TSM Alternatives would not result in potential disruption to the roadway network and therefore are not evaluated as part of the construction impacts analysis.

Areas of a roadway where user conditions would be changed due to construction activities are called traffic control zones. Most of the potential traffic control zones would be divided into four areas: advance warning area, transition area, construction activity area, and termination area. A traffic control zone also includes the streets that would serve as detour routes on approved traffic control plans.

Maintenance of traffic lanes during construction would follow local agency requirements and standards with respect to minimum lane widths, number of lanes, and duration of temporary lane closures. During non-working construction time periods, existing traffic lanes (including turn lanes and two-way left turn lanes) generally would be restored to their pre-construction/original condition unless otherwise authorized by the local jurisdiction.

Street closures would generally be limited to nighttime, weekend, and/or off peak closures and must be authorized by the local jurisdiction. No closures are expected during morning and afternoon peak travel periods except for specific areas discussed in the following sections. Potential street closure locations would be identified in close coordination with the local agencies. Potential construction impacts to transit, traffic circulation, parking, and other modes of transportation for each build alternative are evaluated in the following sections.

### 5.2.1 At-Grade Emphasis LRT Alternative

#### 5.2.1.1 Transit

Construction of the At-Grade Emphasis LRT Alternative may require temporary closure of traffic lanes over and above the lanes permanently removed to place the trackway planned for the street during the night, weekends, and/or off-peak hours. Closures of several blocks on certain streets may also be required. When traffic lanes are closed during the day, transit bus service would be maintained where feasible. Travel times may increase due to the potential for increased traffic congestion as a result of construction activities and proposed lane closures.

Relocation of utilities and construction of the trackway, stations, and the proposed Alameda Street underpass at Temple Street would require temporary closure of lanes on Flower Street,

Hope Street in the vicinity of General Thaddeus Kosciuszko Way, Main Street, Los Angeles Street, Temple Street, 2<sup>nd</sup> Street, and Alameda Street over and above the number of lanes permanently removed due to the planned trackway. This would reduce roadway capacity and potentially modify existing traffic patterns as drivers bypass congested areas. Travel times for both Metro and non-Metro bus services along these roadways would be impacted.

Track construction and permanent street re-configuration along 2<sup>nd</sup> Street would eliminate eastbound vehicular travel on the segment of roadway between Hill Street and Main Street and require permanent closure of one eastbound travel lane between Main Street and Los Angeles Street. A permanent lane closure would occur between Hill Street and Los Angeles Street on the westbound direction of 2<sup>nd</sup> Street.

During construction, it may be necessary to temporarily close 2<sup>nd</sup> Street for extended periods between Los Angeles Street and Figueroa Street. Travel times for buses traveling along the westbound direction of 2<sup>nd</sup> Street are expected to increase and eastbound buses would be re-routed on to 4<sup>th</sup> Street and/or 1<sup>st</sup> Street. New bus stop locations would be designated for each specific route that is impacted by this permanent change in traffic flow patterns.

Construction of the proposed Alameda Street underpass at Temple Street would also reduce roadway capacity for extended time periods. To maintain two through travel lanes in each direction, the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the intersection approaches would be eliminated. The north and south intersection lane configurations would consist of a shared through and right lane and a shared through and left lane for the segment of Alameda Street between Aliso Street and 1<sup>st</sup> Street.

Existing signal phasing may be changed to split phasing to minimize conflicts between left turns and opposing through movements, and to minimize the formation of queues as a result of a vehicle waiting for a gap in the opposing traffic to conduct a left turn. Consequently, travel times for buses along this segment of Alameda Street would be expected to increase due to potential traffic congestion. Bus stops within the construction area may be temporarily relocated to minimize vehicular queues behind a bus stopped to pick up and/or drop off passengers.

Apart from changes to traffic flow patterns on 2<sup>nd</sup> Street and reduced roadway capacity due to construction of the Alameda Street underpass, it is expected that temporary peak period closures would be minimal. Temporary off-peak period closures would be intermittent, and most construction along the remaining alignment would occur during nighttime and weekend hours. Transit bus service may be affected by night closures of entire street blocks and buses would be re-routed. Construction may require temporary relocation of some bus stops.

Although most potential construction impacts of the At-Grade Emphasis LRT Alternative would be temporary, they would be considered significant and unavoidable.

### 5.2.1.2 Traffic Circulation

Construction of the At-Grade Emphasis LRT Alternative would temporarily interfere with the normal flow of traffic, causing some lanes and streets to be temporarily closed to vehicles. It is possible that block-long sections of streets would be closed temporarily for utility relocation, station construction, and installation of rail.

Construction of a typical underground station is estimated to take about 34 months using cut-and-cover construction methods. The primary impact to traffic, however, is usually associated with the time it takes to install decking over a station box. For stations constructed under existing streets, the top 2 to 3 feet of the roadway would be removed and decking would be installed over an approximately 2- to 3-month period. Assuming the construction methods used and conditions are similar to Metro's experience on the Metro Gold Line to East Los Angeles project, the roadway removal and decking could be minimized to several weekends. Construction of the station would continue while traffic travels on the decking. This procedure would require temporary off-peak, nighttime, and/or weekend street closures to install the decking. Traffic would be rerouted to adjacent intersections using clearly signed and marked detours when street closures are required.

For at-grade LRT sections, the street area within and alongside the station areas, supplemented by adjacent sidewalks and off-street areas, would be used for construction staging and equipment and material storage. Haul and delivery truck routes would affect residents and commuters along the alignment. Tunnel spoil hauling, rail and catenary deliveries, and general construction traffic would impact traffic flow patterns as well. In addition to affecting traffic movements, there may be slight physical damage to roads from hauling trucks.

Relocation of utilities and construction of the trackway, stations, and the proposed Alameda Street underpass would require temporary closure of lanes. This would reduce roadway capacity and potentially modify existing traffic patterns as drivers bypass congested areas. Vehicular travel times and intersection operations along these roadways would be impacted.

Track construction and permanent street re-configuration along 2<sup>nd</sup> Street would eliminate eastbound vehicular travel on the segment of roadway between Hill Street and Main Street and require permanent closure of one eastbound travel lane between Main and Los Angeles Streets. For the westbound direction of 2<sup>nd</sup> Street, a one lane permanent closure would occur between Hill Street and Los Angeles Street. It may be necessary to temporarily close 2<sup>nd</sup> Street for extended periods of time between Los Angeles Street and Figueroa Street during construction.

Travel times for vehicles traveling along the westbound direction of 2<sup>nd</sup> Street are expected to increase. Eastbound vehicular through traffic would be re-routed onto 4<sup>th</sup> Street and/or 1<sup>st</sup> Street, depending on their origin and destination. The shift in traffic onto both 4<sup>th</sup> and 1<sup>st</sup> Streets would increase delays at several intersections between Hill Street and Los Angeles Street.

Construction of the proposed Alameda Street underpass at Temple Street would reduce roadway capacity for extended periods of time. Maintaining two through travel lanes in each direction during construction would require elimination of the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the intersection approaches. The north and south intersection lane configurations would consist of a shared through and right lane and a shared through and left lane for the segment of Alameda Street between Aliso Street and 1<sup>st</sup> Street.

The existing signal phasing may be changed to split phasing to minimize conflicts between left turns and opposing through movements. This change would also minimize the formation of queues resulting from vehicles waiting for a gap in the opposing traffic to make a left turn. Consequently, travel times along this segment of Alameda Street would be expected to increase due to increased traffic congestion during peak periods and, to a lesser extent, during off-peak periods. Operating conditions for Alameda Street intersections between Aliso Street and 1<sup>st</sup> Street would also be expected to deteriorate.

Apart from traffic flow patterns, changes on 2<sup>nd</sup> Street, and reduced roadway capacity from construction of the Alameda Street underpass, temporary peak period closures would be minimal and temporary off-peak period closures would be intermittent. Most construction along the rest of the alignment would take place during the nighttime and weekend hours. Traffic would be re-routed and detours clearly signed and marked during night closures of entire street blocks.

Although the majority of the impacts identified under the At-Grade Emphasis LRT Alternative may be temporary, they would be significant and unavoidable.

### 5.2.1.3 Parking

It may be necessary to prohibit on-street curb parking when traffic lanes are closed or eliminated due to construction activities. Existing parking meters within the traffic control zone of influence that would be affected by construction would be removed or covered as directed by the agency with jurisdiction. To minimize the loss of crucial commercial parking, contractors would be required to have all employees park off-street at Metro-approved locations.

During construction, the At-Grade Emphasis LRT Alternative would require temporary closure of lanes. Consequently, existing on-street parking spaces and loading stalls would be

temporarily removed. This would impact parking spaces and loading areas on the east and west sides of Flower Street, the loading areas on the east side of Main Street and Los Angeles Street, and the parking spaces on the south side of Temple Street. In addition, the realigned intersection of Hope Street in the vicinity of General Thaddeus Kosciuszko Way may temporarily require removal of several parking spaces along both the east and west sides of that roadway segment.

Track construction and permanent street re-configuration along 2<sup>nd</sup> Street would temporarily remove several parking and loading stalls. In the vicinity of the Alameda Street underpass, the Japanese American National Museum tour bus loading zone on the west side of the street would be permanently removed and relocated.

Parking impacts identified during construction of the At-Grade Emphasis LRT Alternative would not be adverse or significant.

#### 5.2.1.4 Other Modes

When construction encroaches into a sidewalk, walkway, or crosswalk area, special consideration would be given to pedestrian safety. Pedestrian access to adjoining properties and bicycle traffic movements would be maintained during construction; however, portions of sidewalks may be temporarily closed for decking construction at cut-and-cover station areas. Temporary nighttime closures of sidewalks and crosswalks may be necessary. Lane reductions and street closures could inhibit the flow of bicycle traffic during construction.

The At-Grade Emphasis LRT Alternative includes track construction and permanent street configuration changes along 2<sup>nd</sup> Street and construction of an underpass on Alameda Street. Both would require lane closures for extended periods of time, and may also require temporary sidewalk closures. Construction along 2<sup>nd</sup> Street would shift some of the through traffic movements onto 1<sup>st</sup> Street, which is designated as a Class III bicycle route. Consequently, the flow of bicycle traffic could be hampered due to increased traffic volumes on 1<sup>st</sup> Street.

Construction of the underpass on Alameda Street may result in localized shifts in traffic to adjacent roadway segments such as Central Avenue, which is also designated as a Class III bicycle route. Similarly, the increase in traffic volumes would impact the flow of bicycle traffic. Temporary sidewalk closures during construction of this alternative would also impact pedestrian flow.

Although temporary, the identified potential impacts during construction on pedestrian and bicycle movements would be significant and unavoidable.



## 5.2.2 Underground Emphasis LRT Alternative

### 5.2.2.1 Transit

Relocation of utilities and the construction of cut-and-cover stations and the proposed Alameda Street underpass at 1<sup>st</sup> Street would require temporary closure of lanes on Flower Street, Hope Street in the vicinity of General Thaddeus Kosciuszko Way, and Alameda Street. This would reduce roadway capacity and potentially modify existing traffic patterns as drivers bypass congested areas.

Travel times for both Metro and non-Metro bus services along these roadways would be impacted. Temporary peak period closures would be minimal and temporary off-peak period closures would be intermittent, especially if most construction for station areas affecting surface lanes takes place during the nighttime and weekend hours similar to the methods used for the Metro Gold Line to East Los Angeles project. During night closures, transit bus service may be affected and buses would be re-routed. Accordingly, some bus stops may need to be temporarily relocated due to construction.

Construction of the proposed Alameda Street underpass at 1<sup>st</sup> Street would reduce roadway capacity for extended times during construction. To maintain two through travel lanes in each direction, the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the intersection approaches would be eliminated. The north and south intersection lane configurations would consist of a shared through and right lane and a shared through and left lane for the segment of Alameda Street between Temple Street and 2<sup>nd</sup> Street.

Existing signal phasing may be changed to split phasing to minimize potential conflicts between left turns and opposing through movements and prevent formation of queues as a result of a vehicle waiting for a gap in the opposing traffic to conduct a left turn movement. Therefore, travel times for buses operating along this segment of Alameda Street would be expected to increase due to the potential for increased traffic congestion. Bus stops within the construction area may need to be temporarily relocated to minimize the formation of vehicular queues behind a bus stopped to pick up and/or drop off passengers.

Although most impacts identified under the Underground Emphasis LRT Alternative may be temporary, they would be significant and unavoidable.

### 5.2.2.2 Traffic Circulation

Construction activities for the Underground Emphasis LRT Alternative would require temporary closure of lanes on Flower Street, Hope Street in the vicinity of General Thaddeus Kosciuszko Way, 2<sup>nd</sup> Street, and Alameda Street. This would reduce roadway capacity and potentially modify existing traffic patterns as drivers bypass congested areas. Vehicular travel times and intersection operations along these roadways would be impacted.

It is anticipated that temporary peak period closures would be minimal and temporary off-peak period closures would be intermittent, with most station area construction activities that affect surface streets taking place during the nighttime and weekend hours similar to the methods used for the Metro Gold Line to East Los Angeles project. During night closures, traffic flow patterns may be affected, but would be re-routed accordingly with clearly signed and marked detours.

Construction of a typical underground station is estimated to take about 34 months using cut-and-cover construction methods. However, the primary impact to traffic would be associated with the time it takes to install decking over the station box. At each potential station location this duration would be approximately several weekends, assuming that the construction methods used would be similar to those used on the Metro Gold Line to East Los Angeles.

For stations built under existing streets, the top 2 to 3 feet of the roadway would be removed and decking would be installed over an approximately 2- to 3-month period. Construction of the station would continue while traffic travels on the decking. This procedure would require temporary off-peak, nighttime, and/or weekend street closures to install the decking. As these street closures are identified, traffic would be rerouted to adjacent intersections with clearly signed and marked detours.

Roadway capacity would be reduced for extended time periods during construction of the proposed Alameda Street underpass at 1<sup>st</sup> Street. In order to maintain two through travel lanes in each direction, the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the intersection approaches would be eliminated. The north and south intersection lane configurations would consist of a shared through and right lane and a shared through and left lane for the segment of Alameda Street between Temple Street and 2<sup>nd</sup> Street.

Existing signal phasing may be changed to split phasing to minimize conflicts between left turns and opposing through movements and prevent the formation of queues as a result of vehicles waiting for a gap in the opposing traffic to conduct a left turn movement. Therefore, travel times for vehicles traveling along this segment of Alameda Street would be expected to increase. In addition, operating conditions for the Alameda Street intersections between Temple Street and 2<sup>nd</sup> Street would be expected to deteriorate.

Although most impacts from this alternative may be temporary, they would be significant and unavoidable.

### 5.2.2.3 Parking

Parking impacts under the Underground Emphasis LRT Alternative include temporary closure of lanes. Consequently, existing on-street parking spaces and loading stalls would be temporarily removed.

This would impact parking spaces and loading areas on the east and west sides of Flower Street. The realigned intersection of Hope Street in the vicinity of General Thaddeus Kosciuszko Way may temporarily require removal of several parking spaces along both the east and west sides of the roadway segment. In the vicinity of the Alameda Street underpass, the Japanese American National Museum tour bus loading zone on the west side of the street would be permanently removed and relocated. In addition, several parking spaces would be temporarily displaced from the east side of the roadway segment between 1<sup>st</sup> and 2<sup>nd</sup> Streets.

Parking impacts of the Underground Emphasis LRT Alternative during construction would not be adverse or significant.

#### **5.2.2.4 Other Modes**

The Underground Emphasis LRT Alternative includes cut-and-cover station construction along segments of Flower Street and construction of an underpass on Alameda Street. Both may require temporary sidewalk closures, which would impact pedestrian flow. In addition, construction of the underpass on Alameda Street may result in localized shifts in traffic to adjacent roadway segments such as Central Avenue, which is designated as a Class III bicycle route. Therefore, the flow of bicycle traffic could be impacted due to increased traffic volumes on Central Avenue.

Although temporary, the potential impacts on pedestrian and bicycle movements during construction of the Underground Emphasis LRT Alternative would be significant and unavoidable.

### **5.2.3 Fully Underground LRT Alternative – Little Tokyo Variation 1**

#### **5.2.3.1 Transit**

Construction for the Fully Underground LRT Alternative - Little Tokyo Variation 1 would include relocation of utilities and construction of cut-and-cover stations and the proposed portals east of Alameda Street. This would require temporary closure of lanes on Flower Street, Hope Street in the vicinity of General Thaddeus Kosciuszko Way, Alameda Street, and 1<sup>st</sup> Street, reducing roadway capacity and potentially modifying existing traffic patterns as drivers bypass congested areas.

Travel times for both Metro and non-Metro buses along these roadways would be impacted. It is anticipated that temporary peak period closures would be minimal and temporary off-peak period closures would be intermittent because most construction for the station areas would take place during the nighttime and weekend hours. During night closures, transit bus service may be affected, and buses would be re-routed. Accordingly, bus stops may also need to be temporarily relocated due to construction in some areas.

For this alternative, the Alameda Street portal north of Temple Street would reduce roadway capacity for extended time periods during construction. One through travel lane in each direction would be maintained between Aliso Street and 2<sup>nd</sup> Street. Outside of this area, all three through travel lanes in both directions on Alameda Street would remain open, but would still be subject to shorter-term intermittent closures.

As a result of this configuration, the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the southbound intersection approach with Temple Street would be temporarily removed. The southbound intersection lane configuration at Temple Street would consist of a shared through and right lane and a shared through and left lane. In addition, existing signal phasing may be changed to split phasing to minimize potential conflicts between southbound left turns and the opposing northbound through movements, and prevent the formation of queues resulting from vehicles waiting for a gap in the opposing traffic to conduct a left turn movement.

Travel times for buses operating along this segment of Alameda Street would be expected to increase due to the potential for increased traffic congestion. Additionally, one eastbound travel lane and one westbound travel lane on 1<sup>st</sup> Street between Alameda Street and Vignes Street would need to be closed during construction. This may cause queues, although two lanes of the 1<sup>st</sup> Street Bridge are currently closed for bridge widening and the roadway still typically operates without queuing.

Although most potential impacts under the Fully Underground LRT Alternative - Little Tokyo Variation 1 may be temporary, they would be significant and unavoidable.

#### 5.2.3.2 Traffic Circulation

Construction west of Central Avenue under the Fully Underground LRT Alternative - Little Tokyo Variation 1 would be the same as described for the Underground Emphasis LRT Alternative. Construction would require temporary closure of lanes on Flower Street, 2<sup>nd</sup> Street, Alameda Street, 1<sup>st</sup> Street, and Hope Street in the vicinity of General Thaddeus Kosciuszko Way. This would temporarily reduce roadway capacity and potentially modify existing traffic patterns as drivers bypass congested areas.

Travel times and intersection operating conditions along these roadways would be impacted. It is anticipated that temporary peak period closures would be minimal and temporary off-peak period closures would be intermittent because most station area construction activities that affect surface streets taking place during the nighttime and weekend hours similar to the methods used for the Metro Gold Line to East Los Angeles project. During night closures, traffic flow patterns may be affected, but would be re-routed accordingly with clearly signed and marked detours.

Construction of a typical underground station is estimated to take about 34 months using cut-and-cover construction methods; however, the primary impact to traffic is usually associated with the time it takes to install decking over the station box. At each potential station location this duration would be approximately several weekends, assuming that the construction methods used would be similar to those used on the Metro Gold Line to East Los Angeles.

For stations constructed under existing streets, the top 2 to 3 feet of the roadway would be removed and decking would be installed over approximately a 2- to 3-month period. Construction of a station would continue while traffic travels on the decking. This procedure would require temporary off-peak, nighttime, and/or weekend street closures to install the decking. Where street closures are required, traffic would be rerouted to adjacent intersections with clearly signed and marked detours.

Construction of the proposed Alameda Street portal north of Temple Street would reduce roadway capacity for extended time periods. One through travel lane would be maintained in each direction on Alameda Street during construction between Aliso Street and 2<sup>nd</sup> Street. All three lanes in each direction on Alameda Street would remain open, although they would be subject to shorter-term intermittent closures as needed.

As a result of this configuration, the two-way left turn median in the mid-block area and the exclusive right and left turn lanes at the southbound intersection approach with Temple Street would be temporarily removed. The southbound intersection lane configuration at Temple Street would consist of a shared through and right lane and a shared through and left lane. Existing signal phasing may be changed to split phasing to minimize conflicts between southbound left turns and the opposing northbound through movements and prevent the formation of queues resulting from vehicles waiting for a gap in the opposing traffic to conduct a left turn movement. Consequently, travel times for vehicles traveling along this segment of Alameda Street would be expected to increase and operating conditions for the Alameda Street intersection at Temple Street are expected to deteriorate with increased delays.

One eastbound travel lane and one westbound travel lane on 1<sup>st</sup> Street between Alameda Street and Vignes Street would also need to be closed during construction. Although this may cause formation of queues, two lanes of the 1<sup>st</sup> Street Bridge are currently closed near this location and the roadway still typically operates without queuing.

Although most potential impacts of construction of the Fully Underground LRT Alternative - Little Tokyo Variation 1 may be temporary, they would be significant and unavoidable.

### 5.2.3.3 Parking

Construction activities west of Central Avenue would be the same as described for the Underground Emphasis LRT Alternative. Therefore, parking impacts would be the same due

to temporary closure of lanes on Flower Street and Hope Street in the vicinity of General Thaddeus Kosciuszko Way. Existing on-street parking spaces and loading stalls would be temporarily removed, impacting parking spaces and loading areas on the east and west sides of Flower Street. In addition, the realigned intersection of Hope Street in the vicinity of General Thaddeus Kosciuszko Way may temporarily remove several parking spaces along both the east and west sides of the roadway segment. The proposed Alameda Street portal north of Temple Street may require loading areas to be displaced for extended times during construction.

Potential parking impacts during construction of the Fully Underground LRT Alternative - Little Tokyo Variation 1 would not be adverse or significant.

#### **5.2.3.4 Other Modes**

Construction activities and potential impacts to pedestrian and bicycle flow for this alternative would be the same as for the Underground Emphasis LRT Alternative west of Central Avenue. During construction of the proposed Alameda Street portal north of Temple Street, roadway capacity would be reduced for extended time periods and the sidewalk on the east side of Alameda Street would be eliminated, impacting both pedestrian and bicycle flow.

Although temporary, potential impacts on pedestrian and bicycle movements during construction of the Fully Underground LRT Alternative - Little Tokyo Variation 1 would be significant and unavoidable.

### **5.2.4 Fully Underground LRT Alternative – Little Tokyo Variation 2**

#### **5.2.4.1 Transit**

Transit impacts from construction of the Fully Underground LRT Alternative - Little Tokyo Variation 2 would be the same as for the Fully Underground LRT Alternative – Little Tokyo Variation 1. However, Variation 2 would also include a proposed two-portal configuration on 1<sup>st</sup> Street east of Alameda Street. Construction of the eastbound portal would require temporary closure of one eastbound travel lane and one westbound travel lane along 1<sup>st</sup> Street, between Hewitt Street and Vignes Street, for extended periods. This would reduce the eastbound roadway capacity and may potentially modify existing traffic flow patterns for vehicles trying to bypass congestion during construction activities.

Travel times for Metro bus service along this roadway would be impacted and expected to increase due to the potential for increased traffic congestion. Bus stops within the construction area may need to be temporarily relocated to minimize the formation of vehicular queues behind a bus stopped to pick up and/or drop off passengers.

Although most potential impacts under the Fully Underground LRT Alternative - Little Tokyo Variation 2 may be temporary, they would be significant and unavoidable.

#### 5.2.4.2 Traffic Circulation

Traffic impacts due to construction of the Fully Underground LRT Alternative - Little Tokyo Variation 2 would be the same as those described for the Fully Underground LRT Alternative – Little Tokyo Variation 1. However, this alternative also includes a proposed two-portal configuration on 1<sup>st</sup> Street east of Alameda Street. Construction of the eastbound portal would require temporary closure of one eastbound travel lane and one westbound travel lane along 1<sup>st</sup> Street between Alameda Street and Vignes Street for extended periods. This would reduce eastbound roadway capacity and may potentially modify existing traffic flow patterns for vehicles trying to bypass congestion during construction activities. Travel times and intersection operations along this roadway segment would be impacted, and delays would be expected to increase due to the potential for increased traffic congestion during peak periods. However, two lanes of the 1<sup>st</sup> Street Bridge are currently closed near this location and the roadway typically operates without long queuing or delays.

Construction of a typical station is estimated to take about 34 months using cut-and-cover construction methods. However, the primary impact to traffic is usually associated with the time it takes to install decking over the station box. At each potential station location this duration would be approximately several weekends, assuming that the construction methods used would be similar to those used on the Metro Gold Line to East Los Angeles.

For stations built under existing streets, the top 2 to 3 feet of the roadway would be removed and decking would be installed over an approximately 2- to 3-month period. Construction of the station would continue while traffic travels on the decking. This procedure would require temporary off-peak, nighttime, and/or weekend street closures to install the decking. Traffic would be rerouted to adjacent intersections with clearly signed and marked detours as closures occur.

Although most potential impacts under the Fully Underground LRT Alternative - Little Tokyo Variation 2 may be temporary, they would be significant and unavoidable.

#### 5.2.4.3 Parking

Parking and loading impacts from construction of the Fully Underground LRT Alternative - Little Tokyo Variation 2 would be the same as described for the Fully Underground LRT Alternative – Little Tokyo Variation 1. The proposed two-portal configuration on 1<sup>st</sup> Street east of Alameda Street would require temporary closure of one eastbound travel lane and one westbound travel lane along 1<sup>st</sup> Street between Hewitt and Vignes Streets for extended periods to accommodate the eastbound portal. Consequently, any parking spaces on the south side of the affected roadway segment would be temporarily removed.

Potential parking impacts during construction of the Fully Underground LRT Alternative - Little Tokyo Variation 2 would not be adverse or significant.



#### 5.2.4.4 Other Modes

West of Central Avenue, construction of the proposed Alameda Street portal under the Fully Underground LRT Alternative - Little Tokyo Variation 2 would have similar impacts to pedestrian and bicycle flow as described for the Underground Emphasis LRT Alternative. This alternative also includes a proposed two-portal configuration on 1<sup>st</sup> Street east of Alameda Street.

Construction of the eastbound portal would require temporary closure of one eastbound travel lane along 1<sup>st</sup> Street between Hewitt Street and Vignes Street for extended periods. 1<sup>st</sup> Street is designated as a Class III bicycle route, and the flow of bicycle traffic would be impacted due to reduced roadway capacity.

Although temporary, potential impacts on pedestrian and bicycle movements during construction of the Fully Underground LRT Alternative - Little Tokyo Variation 2 would be significant and unavoidable.





## 6.0 POTENTIAL MITIGATION MEASURES

This section identifies potential mitigation measures for both construction and operation of the proposed alternatives. As with Section 5, discussion is focused on the transportation components being evaluated. These include transit, traffic circulation, parking, and other modes such as pedestrians and bicycles.

### 6.1 Potential Mitigation Measures Due to Operational Impacts

#### 6.1.1 Transit

No mitigation measures are required for transit because no significant impacts have been identified. Displacement of bus stops or shifts in bus routes to adjacent roadways caused by at-grade configuration of the LRT alignment would require schedules to be adjusted and bus patrons notified of these changes. If an at-grade LRT alignment displaces existing bus stops, a replacement bus stop would be designated within one-eighth of a mile of the original stop. Bus stops would be relocated to the adjacent corner of the same intersection, if possible, to maintain service access for bus passengers.

Local bus service schedules would be reviewed and adjusted, if required, to reflect the modified traffic conditions and travel times with at-grade LRT operations. Stations would include a kiosk for displaying bus and rail system maps. These measures would reduce any potential transit-related impacts to a level that is less than significant.

#### 6.1.2 Traffic Circulation

Impacted intersection locations for the TSM Alternative and each build alternative were evaluated to identify potential mitigation measures that would reduce the impact to a less than significant level. Potential measures may include converting or modifying current lane designations, optimizing the signal phasing splits, or providing limited widening if right-of-way is available.

Potential mitigation measures are identified in the following sections. Additional traffic mitigation measures, including potential street widening would be analyzed prior to the final design phase of the selected alternative.

##### 6.1.2.1 TSM Alternative

Proposed mitigation measures for potentially impacted intersection locations under the TSM Alternative are summarized below.

- Grand Avenue/1<sup>st</sup> Street –Signal phasing in the westbound direction would accommodate a protected and permitted left turn.

- Alameda Street/1st Street – Restripe the southbound Alameda approach to provide one shared left-turn/through lane, two through lanes, and an exclusive right-turn lane.
- Figueroa Street/2nd Street – Signal phasing in the northbound direction would accommodate a protected and permitted left turn.
- Hill Street/3rd Street – Restripe the northbound Hill approach to provide one shared left-turn/through lane and two through lanes.
- Broadway/3rd Street – Restripe the westbound 3rd approach to provide one shared left-turn/through lane, two through lanes, and an exclusive right-turn lane.
- Spring Street/3rd Street – Restripe the southbound Spring approach to provide three through lanes and an exclusive right-turn lane, and optimize the signal splits.
- Los Angeles Street/3rd Street – Restripe the southbound Los Angeles approach to provide two through lanes and one shared through/right-turn lane.
- Grand Avenue/5th Street – Restripe the southbound approach on Grand Avenue to accommodate two through lanes, one shared through/right-turn lane, and an exclusive right-turn lane.
- Figueroa Street/Wilshire Boulevard – Restripe the northbound approach on Figueroa Street to accommodate one shared left-turn/through lane, four through lanes, and a shared through/right-turn lane.
- Flower Street/Wilshire Boulevard – Restripe the southbound Flower approach to provide one shared left-turn/through lane, three through lanes, and an exclusive right-turn lane.
- Figueroa Street/8th Street – Restripe the northbound Figueroa approach to provide one shared left-turn/through lane and six through lanes, and optimize the signal splits in the PM peak hour.
- Hill Street/Temple Street – Restripe the westbound Temple approach to provide one shared left-turn/through lane, one through lane, and one shared through/right-turn lane.
- Broadway/Temple Street – Restripe the northbound Broadway approach to provide one left-turn lane, two through lanes, and one shared through/right-turn lane.
- Alameda Street/Aliso Street – The eastbound phase would accommodate a free right-turn.

- Alameda Street / Los Angeles Street North – Restripe the southbound Alameda approach to provide three through lanes and an exclusive right-turn lane.

Table 6-1 shows LOS results after mitigation and identifies intersection locations where a residual significant impact would occur. For the TSM Alternative, all impacts could be mitigated to a less than significant level.

Table 6-1. Year 2035 TSM Alternative with Mitigation: Intersection LOS and Residual Impacts							
No.	Intersection	No Build		TSM w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	65.3	E	66.0	0.7	No
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	D	40.5	-3.9	No
10	Figueroa Street / 2 <sup>nd</sup> Street	C	25.8	C	24.9	-0.9	No
23	Hill Street / 3 <sup>rd</sup> Street	E	58.7	E	61.1	2.4	No
24	Broadway / 3 <sup>rd</sup> Street	F	86.9	C	26.6	-60.3	No
25	Spring Street / 3 <sup>rd</sup> Street	F	87.8	E	61.9	-25.9	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	67.1	E	55.5	-11.6	No
36	Grand Avenue / 5 <sup>th</sup> Street	C	21.8	C	23.5	1.7	No
43	Figueroa Street / Wilshire Blvd.	E	61.6	D	43.3	-18.3	No
44	Flower Street / Wilshire Blvd.	D	41.0	D	39.4	-1.6	No
50	Figueroa Street / 8 <sup>th</sup> Street	B	16.6	B	16.4	-0.2	No
54	Hill Street / Temple Street	D	35.2	D	35.1	-0.1	No
55	Broadway / Temple Street	E	70.1	E	71.2	1.1	No
62	Alameda Street / Aliso Street	F	88.5	E	72.8	-15.7	No

**Table 6-1. Year 2035 TSM Alternative with Mitigation:  
Intersection LOS and Residual Impacts**

No.	Intersection	No Build		TSM w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
65-1	Alameda Street / Los Angeles Street N.	D	40.4	D	37.4	-3.0	No
<b>PM Peak Hour</b>							
1	Grand Avenue / 1 <sup>st</sup> Street	E	56.2	E	55.0	-1.2	No
9	Alameda Street / 1 <sup>st</sup> Street	F	97.6	F	94.7	-2.9	No
10	Figueroa Street / 2 <sup>nd</sup> Street	F	120.7	F	119.4	-1.3	No
23	Hill Street / 3 <sup>rd</sup> Street	D	48.5	D	36.0	-12.5	No
24	Broadway / 3 <sup>rd</sup> Street	E	65.7	C	25.7	-40.0	No
25	Spring Street / 3 <sup>rd</sup> Street	E	55.9	D	51.5	-4.4	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	C	23.9	C	26.0	2.1	No
36	Grand Avenue / 5 <sup>th</sup> Street	E	58.5	D	49.6	-8.9	No
43	Figueroa Street / Wilshire Blvd.	F	206.8	F	190.4	-16.4	No
44	Flower Street / Wilshire Blvd.	D	44.2	C	34.9	-9.3	No
50	Figueroa Street / 8 <sup>th</sup> Street	F	94.2	C	29.7	-64.5	No
54	Hill Street / Temple Street	F	95.1	F	82.0	-13.1	No
55	Broadway / Temple Street	E	69.1	E	68.9	-0.2	No
62	Alameda Street / Aliso Street	D	48.9	D	49.5	0.6	No
65-1	Alameda Street / Los Angeles Street N.	C	26.2	C	28.5	2.3	No

### 6.1.2.2 At-Grade Emphasis LRT Alternative

Proposed mitigation measures for potentially impacted intersection locations under the At-Grade Emphasis LRT Alternative are summarized below.

- Hill Street/1<sup>st</sup> Street – Restripe the eastbound 1<sup>st</sup> approach to provide one left-turn lane, one shared left-turn/through lane, one through lane, and one shared through/right-turn lane.
- Broadway/1<sup>st</sup> Street – No mitigation measures would be feasible at this location.
- Main Street/1<sup>st</sup> Street – Restripe the eastbound 1<sup>st</sup> approach to provide one shared left-turn/through lane, and three through lanes.
- Los Angeles Street/1<sup>st</sup> Street – No mitigation measures would be feasible at this location.
- Alameda Street/1<sup>st</sup> Street – Restripe the northbound Alameda approach to provide one left-turn lane, two through lanes, and one shared through/right-turn lane.
- Hill Street/2<sup>nd</sup> Street – Convert signal phasing in the eastbound and westbound directions to permit left turns, and the northbound direction to protected left turns. Adjust signal splits to maintain and optimize the same cycle length.
- Broadway/2<sup>nd</sup> Street – Restripe the northbound Broadway approach to provide one shared left-turn/through lane and three through lanes.
- Los Angeles Street/2<sup>nd</sup> Street – Restripe the northbound Los Angeles approach to provide one shared left-turn/through lane, one through lane, and one shared through/right-turn lane. Then optimize the signal splits in the AM peak hour.
- Flower Street/3<sup>rd</sup> Street – There would be no feasible mitigation measures at this location.
- Hill Street/3<sup>rd</sup> Street – Restripe the westbound 3<sup>rd</sup> Street approach to provide one shared left-turn/through lane, two through lanes, and one exclusive right-turn lane.
- Broadway/3<sup>rd</sup> Street – Restripe the westbound 3<sup>rd</sup> Street approach to provide one shared left-turn/through lane, two through lanes, and one exclusive right-turn lane.
- Spring Street/3<sup>rd</sup> Street – Restripe the westbound 3<sup>rd</sup> Street approach to provide one shared left-turn/through lane, two through lanes, and optimize the signal splits.

- Main Street/3<sup>rd</sup> Street – Restripe the westbound 3<sup>rd</sup> Street approach to provide three through lanes and one shared through/right-turn lane, and optimize the signal splits.
- Los Angeles Street/3<sup>rd</sup> Street – Restripe the westbound 3<sup>rd</sup> Street approach to provide one left-turn lane, three through lanes, one shared through/right-turn lane, and optimize the signal splits.
- Flower Street/4<sup>th</sup> Street – There would be no feasible mitigation measures at this location.
- Flower Street/5<sup>th</sup> Street – Convert signal phasing in the westbound direction to a protected left turn; the cycle length would remain unchanged.
- Flower Street/6<sup>th</sup> Street – Restripe the southbound Flower Street approach to provide two left-turn lanes and three through lanes.
- Main Street/Temple Street – Restripe the eastbound Temple Street approach to provide one shared left-turn/through lane and two through lanes.
- Los Angeles Street/Temple Street – Restripe the eastbound approach on Temple Street to accommodate one shared left-turn/through lane and one shared through/right-turn lane. The northbound approach on Los Angeles Street would accommodate one shared left-turn/through lane, one through lane, and one shared through/right-turn lane.
- Judge John Aiso Street/Temple Street – Restripe the westbound Temple approach to provide one shared left-turn/through lane and one through lane.
- Los Angeles Street/Aliso Street – Restripe the northbound Los Angeles approach to provide one through lane, one shared through/right-turn lane, and one exclusive right-turn lane. Then optimize the signal splits.
- Alameda Street/Aliso Street – Restripe the southbound Alameda approach to provide one shared left-turn/through lane and three through lanes. Then optimize the signal splits.
- Hill Street/4<sup>th</sup> Street – Restripe the eastbound 4<sup>th</sup> Street approach to provide one shared left-turn/through lane, three through lanes, and one shared through/right-turn lane. The southbound approach on Hill Street would provide one left-turn lane, one shared left-turn/through lane, and two through lanes.
- Broadway/4<sup>th</sup> Street – Restripe the southbound Broadway approach to provide one shared left-turn/through lane and two through lanes. Then optimize splits.

- Spring Street/4<sup>th</sup> Street – Restripe the eastbound 4<sup>th</sup> Street approach to provide three through lanes and one exclusive right-turn lane.
- Main Street/4<sup>th</sup> Street – There would be no feasible mitigation measures at this location.

Table 6-2 shows the level of service results after mitigation and identifies intersection locations where residual significant impacts would occur. After mitigation measures are implemented for the At-Grade Emphasis LRT Alternative, 11 of the 18 impacted intersection locations would continue to be impacted to significant levels during the AM peak hour. Similarly, in the PM peak hour, 15 of the 26 impacted intersection locations would continue to be impacted to significant levels.

**Table 6-2. Year 2035 At-Grade Emphasis LRT Alternative with Mitigation: Intersection LOS and Residual Impacts**

No.	Intersection	No Build		At-Grade w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
2	Hill Street / 1 <sup>st</sup> Street	C	24.1	C	33.3	<b>9.2</b>	<b>Yes</b>
3	Broadway / 1 <sup>st</sup> Street	C	24.0	C	23.9	-0.1	No
5	Main Street / 1 <sup>st</sup> Street	B	16.5	B	14.0	-2.5	No
6	Los Angeles Street / 1 <sup>st</sup> Street	B	16.6	C	23.1	<b>6.5</b>	<b>Yes</b>
9	Alameda Street / 1 <sup>st</sup> Street	D	44.4	E	75.8	<b>31.4</b>	<b>Yes</b>
12	Hill Street / 2 <sup>nd</sup> Street	B	19.7	F	210.7	<b>191.0</b>	<b>Yes</b>
13	Broadway / 2 <sup>nd</sup> Street	B	18.4	C	24.7	<b>6.3</b>	<b>Yes</b>
16	Los Angeles Street / 2 <sup>nd</sup> Street	B	14.8	E	75.3	<b>60.5</b>	<b>Yes</b>
21	Flower Street / 3 <sup>rd</sup> Street	C	28.4	D	45.8	<b>17.4</b>	<b>Yes</b>
23	Hill Street / 3 <sup>rd</sup> Street	E	58.7	F	86.8	<b>28.1</b>	<b>Yes</b>
24	Broadway / 3 <sup>rd</sup> Street	F	86.9	D	35.8	-51.1	No



**Table 6-2. Year 2035 At-Grade Emphasis LRT Alternative with Mitigation: Intersection LOS and Residual Impacts**

No.	Intersection	No Build		At-Grade w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
25	Spring Street / 3 <sup>rd</sup> Street	F	87.8	D	46.5	-41.3	No
26	Main Street / 3 <sup>rd</sup> Street	C	22.7	B	18.1	-4.6	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	E	67.1	B	17.3	-49.8	No
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	F	199.3	<b>159.7</b>	<b>Yes</b>
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	21.0	-1.3	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	D	36.0	3.4	No
57	Main Street / Temple Street	B	11.4	B	16.7	5.3	No
58	Los Angeles Street / Temple Street	B	19.7	F	140.8	<b>121.1</b>	<b>Yes</b>
59	Judge John Aiso Street / Temple Street	A	5.6	B	18.7	13.1	No
61	Los Angeles Street / Aliso Street	B	12.9	B	11.8	-1.1	No
62	Alameda Street / Aliso Street	F	88.5	E	71.2	-17.3	No
77	Hill Street / 4 <sup>th</sup> Street	B	18.3	D	43.2	<b>24.9</b>	<b>Yes</b>
79	Broadway / 4 <sup>th</sup> Street	B	14.8	B	16.9	2.1	No
80	Spring Street / 4 <sup>th</sup> Street	B	13.9	B	16.5	2.6	No
81	Main Street / 4 <sup>th</sup> Street	B	11.8	B	13.4	1.6	No
<b>PM Peak Hour</b>							
2	Hill Street / 1 <sup>st</sup> Street	E	67.2	E	79.6	<b>12.4</b>	<b>Yes</b>
3	Broadway / 1 <sup>st</sup> Street	C	30.5	D	53.6	<b>23.1</b>	<b>Yes</b>

**Table 6-2. Year 2035 At-Grade Emphasis LRT Alternative with Mitigation: Intersection LOS and Residual Impacts**

No.	Intersection	No Build		At-Grade w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
5	Main Street / 1 <sup>st</sup> Street	D	53.0	F	92.4	<b>39.4</b>	<b>Yes</b>
6	Los Angeles Street / 1 <sup>st</sup> Street	F	102.9	F	126.2	<b>23.3</b>	<b>Yes</b>
9	Alameda Street / 1 <sup>st</sup> Street	F	97.6	E	75.7	-21.9	No
12	Hill Street / 2 <sup>nd</sup> Street	B	19.9	F	241.8	<b>221.9</b>	<b>Yes</b>
13	Broadway / 2 <sup>nd</sup> Street	C	20.6	C	25.1	4.5	No
16	Los Angeles Street / 2 <sup>nd</sup> Street	C	34.4	D	43.3	<b>8.9</b>	<b>Yes</b>
21	Flower Street / 3 <sup>rd</sup> Street	B	15.7	C	31.7	<b>16.0</b>	<b>Yes</b>
23	Hill Street / 3 <sup>rd</sup> Street	D	48.5	D	48.5	0.0	No
24	Broadway / 3 <sup>rd</sup> Street	E	65.7	D	36.4	-29.3	No
25	Spring Street / 3 <sup>rd</sup> Street	E	55.9	D	47.1	-8.8	No
26	Main Street / 3 <sup>rd</sup> Street	D	39.1	C	27.9	-11.2	No
27	Los Angeles Street / 3 <sup>rd</sup> Street	C	23.9	C	25.6	1.7	No
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	135.1	<b>43.6</b>	<b>Yes</b>
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	26.7	5.9	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	C	34.0	2.1	No
57	Main Street / Temple Street	C	30.2	F	105.0	<b>74.8</b>	<b>Yes</b>
58	Los Angeles Street / Temple Street	C	32.7	F	510.9	<b>478.2</b>	<b>Yes</b>
59	Judge John Aiso Street / Temple Street	B	15.7	F	96.0	<b>80.3</b>	<b>Yes</b>

**Table 6-2. Year 2035 At-Grade Emphasis LRT Alternative with Mitigation: Intersection LOS and Residual Impacts**

No.	Intersection	No Build		At-Grade w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
61	Los Angeles Street / Aliso Street	C	21.7	C	24.8	3.1	No
62	Alameda Street / Aliso Street	D	48.9	E	63.4	<b>14.5</b>	<b>Yes</b>
77	Hill Street / 4 <sup>th</sup> Street	D	45.4	F	100.6	<b>55.2</b>	<b>Yes</b>
79	Broadway / 4 <sup>th</sup> Street	C	22.1	D	52.5	<b>30.4</b>	<b>Yes</b>
80	Spring Street / 4 <sup>th</sup> Street	C	21.4	C	25.2	3.8	No
81	Main Street / 4 <sup>th</sup> Street	C	34.7	E	68.7	<b>34.0</b>	<b>Yes</b>

### 6.1.2.3 Underground Emphasis LRT Alternative

Proposed mitigation measures for potentially impacted intersection locations under the Underground Emphasis LRT Alternative are summarized below.

- Judge John Aiso Street/1<sup>st</sup> Street – Restripe the eastbound 1<sup>st</sup> Street approach to provide one left-turn lane, one shared left-turn/through lane, one through lane, and one exclusive right-turn lane. Restripe the westbound 1<sup>st</sup> Street approach to provide one shared left-turn/through lane, one through lane, and one exclusive right-turn lane. Then optimize the signal splits.
- Alameda Street/2<sup>nd</sup> Street – Restripe the eastbound 2<sup>nd</sup> Street approach to provide one shared left-turn/through lane, one shared through/right-turn lane, and one exclusive right-turn lane. Restripe the westbound 2<sup>nd</sup> Street approach to provide one shared left-turn/through lane and one shared through/right-turn lane. Signal phasing in the westbound direction would be converted to a permitted left turn. Restripe the northbound Alameda approach to provide one left-turn lane, one shared left-turn/through lane, and one shared through/right-turn lane. Then optimize the signal splits.
- Flower Street/4<sup>th</sup> Street – Restripe the southbound Flower Street approach to provide one shared left-turn/through lane and two through lanes. Then optimize the signal splits.

- Flower Street/5<sup>th</sup> Street – Restripe the southbound Flower Street approach to provide three through lanes and one exclusive right-turn lane. Then optimize the signal splits.
- Flower Street/6<sup>th</sup> Street – Restripe the eastbound 6<sup>th</sup> Street approach to provide three through lanes and two exclusive right-turn lanes. Then optimize the signal splits.
- Judge John Aiso Street/Temple Street – Restripe the northbound Judge John Aiso Street approach to provide one left-turn lane, one shared left-turn/right-turn lane, and one exclusive right-turn lane. Then optimize the signal splits.
- Alameda Street/Aliso Street – Restripe the southbound Alameda Street approach to provide one shared left-turn/through lane and three through lanes. Then optimize the signal splits.

Table 6-3 shows the level of service results after mitigation and identifies intersection locations where residual significant impacts would occur. After mitigation measures are implemented for the Underground Emphasis LRT Alternative, two of the three impacted intersection locations would continue to be impacted to significant levels during the AM peak hour. Similarly, three of the seven impacted intersection locations would continue to be impacted to significant levels during the PM peak hour.

Table 6-3. Year 2035 Underground Emphasis LRT Alternative with Mitigation: Intersection LOS and Residual Impacts							
No.	Intersection	No Build		Underground w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
7	Judge John Aiso Street / 1 <sup>st</sup> Street	B	13.9	B	12.1	-1.8	No
19	Alameda Street / 2 <sup>nd</sup> Street	B	15.9	D	39.2	<b>23.3</b>	<b>Yes</b>
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	E	64.8	<b>25.2</b>	<b>Yes</b>
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	24.9	2.6	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	C	28.9	-3.7	No
59	Judge John Aiso Street / Temple	A	5.6	A	8.1	2.5	No

**Table 6-3. Year 2035 Underground Emphasis LRT Alternative with Mitigation:  
Intersection LOS and Residual Impacts**

No.	Intersection	No Build		Underground w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
	Street						
62	Alameda Street / Aliso Street	F	88.5	E	69.3	-19.2	No
<b>PM Peak Hour</b>							
7	Judge John Aiso Street / 1 <sup>st</sup> Street	C	21.1	D	49.3	<b>28.2</b>	<b>Yes</b>
19	Alameda Street / 2 <sup>nd</sup> Street	C	33.1	F	83.6	<b>50.5</b>	<b>Yes</b>
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	92.1	0.6	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	25.3	4.5	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	C	33.1	1.2	No
59	Judge John Aiso Street / Temple Street	B	15.7	C	26.0	<b>10.3</b>	<b>Yes</b>
62	Alameda Street / Aliso Street	D	48.9	C	26.2	-22.7	No

#### 6.1.2.4 Fully Underground LRT Alternative – Little Tokyo Variation 1

Proposed mitigation measures for potentially impacted intersection locations under the Fully Underground LRT Alternative - Little Tokyo Variation 1 are discussed below.

- Flower Street/4<sup>th</sup> Street – Restripe the southbound Flower Street approach to provide one shared left-turn/through lane and two through lanes. Then optimize the signal splits.
- Flower Street/5<sup>th</sup> Street – Restripe the southbound Flower Street approach to provide three through lanes and one exclusive right-turn lane. Then optimize the signal splits.
- Flower Street/6<sup>th</sup> Street – Restripe the eastbound 6<sup>th</sup> Street approach to provide three through lanes and two exclusive right-turn lanes. Then optimize the signal splits.

Table 6-4 shows the level of service results after mitigation and identifies one intersection where a residual significant impact would occur. After mitigation measures are implemented for the Fully Underground LRT Alternative – Little Tokyo Variation 1, this intersection continues to be impacted to significant levels during the AM peak hour. In the PM peak hour, none of the three impacted intersections would continue to be impacted to significant levels. These locations can be mitigated to a less than significant level.

**Table 6-4. Year 2035 Fully Underground LRT Alternative – Little Tokyo Variation 1 with Mitigation: Intersection LOS and Residual Impacts**

No.	Intersection	No Build		Fully Underground w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	E	64.8	25.2	Yes
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	24.9	2.6	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	C	28.9	-3.7	No
<b>PM Peak Hour</b>							
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	92.1	0.6	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	25.3	4.5	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	C	33.1	1.2	No

#### 6.1.2.5 Fully Underground LRT Alternative – Little Tokyo Variation 2

Proposed mitigation measures for potentially impacted intersections under the Fully Underground LRT Alternative - Little Tokyo Variation 2 would be the same as discussed for Little Tokyo Variation 1, and are summarized below.

- Flower Street/4<sup>th</sup> Street – Restripe the southbound Flower Street approach to provide one shared left-turn/through lane and two through lanes. Then optimize the signal splits.
- Flower Street/5<sup>th</sup> Street – Restripe the southbound Flower Street approach to provide three through lanes and one exclusive right-turn lane. Then optimize the signal splits.

- Flower Street/6<sup>th</sup> Street – Restripe the eastbound 6<sup>th</sup> Street approach to provide three through lanes and two exclusive right-turn lanes. Then optimize the signal splits.

Table 6-5 shows the level of service results after mitigation and identifies one intersection where a residual significant impact would occur. After mitigation measures are implemented for the Fully Underground LRT Alternative – Little Tokyo Variation 2, this intersection continues to be impacted to significant levels during the AM peak hour. In the PM peak hour, none of the three impacted intersections would continue to be impacted to significant levels. These locations can be mitigated to a less than significant level.

**Table 6-5. Year 2035 Fully Underground LRT Alternative – Little Tokyo Variation 2 with Mitigation: Intersection LOS and Residual Impacts**

No.	Intersection	No Build		Fully Underground w/ Mitigation		Change in Delay	Residual Impact
		LOS	Delay	LOS	Delay		
<b>AM Peak Hour</b>							
32	Flower Street / 4 <sup>th</sup> Street	D	39.6	E	64.8	25.2	Yes
35	Flower Street / 5 <sup>th</sup> Street	C	22.3	C	24.9	2.6	No
39	Flower Street / 6 <sup>th</sup> Street	C	32.6	C	28.9	-3.7	No
<b>PM Peak Hour</b>							
32	Flower Street / 4 <sup>th</sup> Street	F	91.5	F	92.1	0.6	No
35	Flower Street / 5 <sup>th</sup> Street	C	20.8	C	25.3	4.5	No
39	Flower Street / 6 <sup>th</sup> Street	C	31.9	C	33.1	1.2	No

### 6.1.3 Parking

The number of on-street parking and loading spaces eliminated by the proposed project would be minimal for the Underground Emphasis LRT Alternative, the Fully Underground LRT Alternative – Little Tokyo Variation 1 and the Fully Underground LRT Alternative – Little Tokyo Variation 2. The number of parking spaces removed would increase for the At-Grade Emphasis LRT Alternative due to the at-grade configuration on 2<sup>nd</sup> Street. Spaces would also potentially need to be removed on 2<sup>nd</sup> Street to create bus zones for the TSM Alternative.

Depending on the current use of the affected spaces, replacement in the form of off-street parking at adjacent locations may be considered. Potential parking replacement locations and/or strategies would be identified to mitigate parking impacts.

For the At-Grade Emphasis LRT Alternative and the Underground Emphasis LRT Alternative, the three tour bus loading spaces adjacent to JANM would be relocated to either an acceptable location on 1<sup>st</sup> Street or to the Nikkei Center site, with an understanding that a pedestrian crossing would be installed to provide safe movement from the tour bus loading area to the museum. Metro is committed to implementing a feasible parking replacement plan to reduce parking impacts to a less than significant level.

#### 6.1.4 Other Modes

One major mitigation measure for other modes of transportation would be to implement a Metro-funded Community Linkages Study for the downtown area. The purpose of this study would be to develop pedestrian plans to link major activity centers with stations along the Regional Connector alignment.

Other mitigation measures would include the use of well-defined pedestrian paths, signage, and barriers, where appropriate, to reduce the potential for unsafe LRT track crossings by pedestrians. Distinctive crosswalk treatments such as textured paving and eye-catching designs can capture the attention of pedestrians and encourage the use of crosswalks. Using pedestrian-oriented signal phasing can decrease crossing wait times and reduce the chances of impatient pedestrians crossing against the light.

Train operations would be coordinated with traffic signal phasing to address potential safety issues and minimize delays. In addition, other techniques to increase pedestrian safety, including educational programs for local businesses, marketing and advertisement campaigns, and cohesive signage, may also be used. Similar at-grade LRT lines currently operating within the region could serve as examples of how to address pedestrian safety issues associated with at-grade portions of the proposed project.

To address the issue of bicycle use on 1<sup>st</sup> Street potentially coming into conflict with shifting traffic patterns under the At-Grade Emphasis LRT Alternative, the designation of 1<sup>st</sup> Street as a commuter bicycle facility in the downtown area between Hill and Alameda Streets could be removed. In addition, the designation of Central Avenue as Class III bicycle route between 1<sup>st</sup> and 2<sup>nd</sup> Streets could also be removed. However, in order to maintain network continuity for the regional bikeway plan at these specific segments of the system, parallel streets would need to be designated as bicycle routes.

Bicycle commuter route alternatives would be studied as part of a future Community Linkages Study that could be funded by Metro. No bicycle route mitigation is required for the



remaining downtown roadway segments potentially affected by the proposed project because the streets are not designated bikeway facilities.

## 6.2 Potential Mitigation Measures Due to Construction Impacts

### 6.2.1 Transit

Mitigation plans would be developed by Metro working closely with the City of Los Angeles and potentially affected transit operators. Bus lines that would be affected by lane closures due to construction activities would continue to operate where feasible in the remaining traffic lanes. Bus stops that would be affected by sidewalk construction would be temporarily relocated, and construction activities would be phased to consider the maintenance of bus service and minimize disruption.

During nighttime periods when entire blocks may be closed to traffic, bus lines would be re-routed to adjacent streets in a manner that minimizes 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 still open to bus service.

After these mitigation measures are implemented, temporary relocation of bus stops would continue to cause potentially significant impacts during construction due to the possibility of increased travel times and longer walking distances by transit users.

### 6.2.2 Traffic Circulation

During the final design phase of the project, site- and street-specific Worksite Traffic Control Plans would be developed in cooperation with LADOT to accommodate the required traffic movements. To the extent practical, traffic lanes would be maintained in both directions, particularly during the morning and afternoon peak traffic hours. Access to adjacent businesses via existing or temporary driveways would be maintained throughout the construction period. In addition, Metro would implement a Construction Mitigation Program to coordinate preparation of traffic control plans with community reviews and approvals.

In some cases, specific construction techniques may be used to minimize construction duration, including segmental construction, which would help minimize the need for extensive falsework on the ground. Apart from the proposed elimination of eastbound travel between Hill Street and Main Street on 2<sup>nd</sup> Street in the At-Grade Emphasis LRT Alternative, at least one traffic lane in each direction and pedestrian access would be maintained during construction.

Designated haul routes for trucks would be identified during the final design phase of the project. These routes would be located to minimize noise, vibration, and other possible impacts to adjacent businesses and neighborhoods. If slight physical damage to the haul route roads is found after the project is complete, the roads would be repaired accordingly.

Driveway access for residences would be maintained at all times. Driveway access to business would be maintained for normal business operating hours.

After these mitigation measures are implemented, construction-related traffic impacts would be potentially significant and unavoidable.

### 6.2.3 Parking

Prior to construction, a parking mitigation and circulation plan would be developed by the contractor in coordination with Metro and the City. The purpose of this plan would be to minimize impacts on curb parking.

It may be possible to sequence construction activities so that multiple blocks of on-street parking are not temporarily removed at one time. This would make various on-street parking spaces available in an area under construction.

Some wider streets may be restriped to allow diagonal parking, which would provide a greater number of parking spaces in the area. Some of the parking mitigation measures previously outlined could be developed early so that they may be utilized during the period of construction. Metro would not allow contractor employees to park on unauthorized street parking locations or in private parking lots. Metro may use construction staging areas, lease parking lots, and/or provide construction employees with transit passes (if necessary) to avoid impacts to local parking.

After implementation of these proposed mitigation measures, construction-period parking impacts would not be adverse or significant.

### 6.2.4 Other Modes

Pedestrian movements would not conflict with work site vehicles, equipment, and operations. Special facilities such as handrails, fences, and walkways would be provided for the safety of pedestrians in areas where construction activities would impact sidewalk areas.

When pedestrians are diverted into the street or adjacent to an open trench, Type K-rail concrete barriers would be used as a barricade between pedestrian and vehicular traffic. Sidewalk closures would be approved by the affected agency having jurisdiction and only one side of the street would be closed at a time. If crosswalks are temporarily closed, pedestrians would be directed to use one that is in close proximity to closed one. Adjacent crosswalks would not be closed at the same time so pedestrians could cross streets. Bicyclists would be encouraged through signage to ride with caution in the streets, ride with caution on sidewalks, or choose other routes during construction activities.

During the final design phase of the project, site- and street-specific Worksite Traffic Control Plans would be developed in cooperation with LADOT to accommodate the required

pedestrian and bicycle movements. Access to businesses would be maintained for normal business operating hours. Access to residences would be maintained at all times throughout construction.

After implementation of these mitigation measures, pedestrian and bicycle impacts during construction would be potentially significant and unavoidable.

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## 7.0 CONCLUSIONS

This section identifies the conclusions of the traffic study. In summary, there would be two impact categories: those found to be adverse after mitigation and those found to be not adverse after mitigation.

### 7.1 Transit

No unavoidable adverse impacts to transit operations would occur after mitigation measures have been implemented. Any potential impacts resulting from the displacement of bus stops or shifts in bus routes due to street design changes would no longer be adverse after mitigation. This would be accomplished by adjusting bus schedules and notifying bus patrons so they are aware of any route and time changes.

Proposed developments, either under construction or planned, along the Regional Connector alignment and station areas would benefit from increased transit service. In addition, the transit trips generated by these new development projects would contribute to the operational success of the overall regional LRT system. These beneficial impacts would increase system wide ridership and use of the overall transit system. The No Build and TSM Alternatives, however, would allow continued traffic degradation and provide no reduction in downtown area transfers, decreasing the overall utility of the transit system and resulting in deteriorated service.

Temporary transit route detours during construction could potentially result in adverse impacts. Although efforts would be made to minimize the extent and duration of detours, impacts may remain adverse after mitigation.

### 7.2 Traffic Circulation

#### 7.2.1 No Build Alternative

Potential impacts due to overall growth in the project area are reflected in the No Build Alternative traffic forecasts and associated AM and PM peak hour level of service estimates.

#### 7.2.2 TSM Alternative

A total of 15 intersection locations would be impacted under the TSM Alternative. After implementation of the proposed mitigation measures, traffic circulation impacts at all 15 locations would be mitigated to a less than significant level. There would be no residual impacts for this alternative.

#### 7.2.3 At-Grade Emphasis LRT Alternative

Under the At-Grade Emphasis LRT Alternative, 26 intersections would be impacted in one or both peak hours. After implementation of the proposed mitigation measures, 11 of the 26

impacted intersections would continue to be impacted in the AM peak hour and 15 would continue to be impacted in the PM peak hour. During the AM peak hour, traffic circulation impacts at seven intersections would no longer be adverse after mitigation. During the PM peak hour, traffic circulation impacts at 11 intersections would no longer be adverse after mitigation. In summary, there would 11 intersections with residual impacts in the AM peak hour and 15 with residual impacts in the PM peak hour.

During construction, the additional temporary roadway and lane closures could potentially result in adverse impacts. Although efforts would be made to minimize the extent and duration of closures, impacts may remain adverse after mitigation.

#### **7.2.4 Underground Emphasis LRT Alternative**

Seven intersection locations would be potentially impacted in one or both peak hours. After the implementation of the proposed mitigation measures, two of the seven impacted intersections would continue to be impacted in the AM peak hour and three would continue to be impacted in the PM peak hour. During the AM peak hour, traffic circulation impacts at one intersection could be mitigated to a level where they would no longer be adverse. During the PM peak hour, four intersections could be mitigated to a level where they would no longer be adverse. In summary, there would be two intersections with residual impacts in the AM peak hour and three with residual impacts in the PM peak hour.

During construction, additional temporary roadway and lane closures could potentially result in adverse impacts. Although efforts would be made to minimize the extent and duration of closures, impacts may remain adverse after mitigation.

#### **7.2.5 Fully Underground LRT Alternative – Little Tokyo Variation 1**

Under the Fully Underground LRT Alternative - Little Tokyo Variation 1, three intersection locations would be impacted in one or both peak hours. After the implementation of the proposed mitigation measures, traffic circulation impacts at one of the three impacted intersections would continue to be adverse in the AM peak hour and traffic circulation impacts at all three would be mitigated to a level where they would no longer be adverse in the PM peak hour. During the AM peak hour, the one impacted intersection would continue to experience adverse impacts. During the PM peak hour, traffic circulation impacts at all three intersections could be mitigated to a level where they would no longer be adverse. In summary, there would be one intersection with residual impacts in the AM peak hour and no residual impacts in the PM peak hour.

During construction, additional temporary roadway and lane closures could potentially result in adverse impacts. Although efforts would be made to minimize the extent and duration of closures, impacts may remain adverse after mitigation.

### 7.2.6 Fully Underground LRT Alternative – Little Tokyo Variation 2

The operational results and conclusions of this alternative are the same as for the Fully Underground LRT Alternative - Little Tokyo Variation 1. Three intersections would be impacted in one or both peak hours. After the implementation of the proposed mitigation measures, one of the three impacted intersections would continue to experience adverse traffic circulation impacts in the AM peak hour, and none would experience adverse impacts in the PM peak hour. In summary, there would be one intersection location with residual impacts in the AM peak hour and no residual impacts in the PM peak hour.

During construction, additional temporary roadway and lane closures could potentially result in adverse impacts. Although efforts would be made to minimize the extent and duration of closures, impacts may remain adverse after mitigation.

Table 7-1 summarizes the conclusions of this traffic evaluation. The table compares the number of impacted intersections for each build alternative to no build conditions both with and without mitigation. It also identifies the number of intersections that would continue to be impacted after implementation of feasible mitigation measures.

Alternative Under Consideration	Impacted Intersections		Impacted After Mitigation	
	AM Peak	PM Peak	AM Peak	PM Peak
No Build	-----	-----	-----	-----
TSM	8	9	0	0
At-Grade Emphasis	18	26	11	15
Underground Emphasis	3	7	2	3
Fully Underground – Little Tokyo Variation 1	1	3	1	0
Fully Underground – Little Tokyo Variation 2	1	3	1	0

### 7.3 Parking

No unavoidable significant adverse impacts would occur after mitigation measures have been implemented for any of the alternatives. Replacement parking such as off-street parking at

adjacent existing locations may be required. Potential parking replacement locations and/or strategies would be identified to mitigate parking impacts. Metro is committed to implementing a feasible parking replacement plan to reduce parking impacts to a less than significant level.

During construction, additional temporary curb parking restrictions could potentially result in short-term loss of parking. Efforts would be made to provide nearby replacement parking and minimize the extent and duration of restrictions, and impacts would not be adverse or significant after mitigation.

## 7.4 Other Modes

No unavoidable significant adverse impacts to other modes of transportation would occur after implementation of proposed mitigation measures. For potential impacts to pedestrians, Metro could fund a Community Linkages Study for the downtown area. The purpose of this study would be development of pedestrian plans to link major activity centers with stations along the Regional Connector alignment. For bicycles, a parallel street would be identified and designated as a bikeway facility to mitigate removal of the Commuter Bikeway classification on 1<sup>st</sup> Street. An alternative route would be developed during the Community Linkages Study.

During construction, temporary pedestrian and bicycle detours could potentially result in adverse impacts. Although efforts would be made to minimize the extent and duration of detours, impacts may remain adverse after mitigation.

## 8.0 REFERENCES CITED

Transportation Research Board (TRB). 1980. Transportation Research Circular No. 212: Interim Materials on Highway Capacity, January 1980.

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