ES.1 Introduction

The East San Fernando Valley Transit Corridor Project is a vital public transit infrastructure investment that would provide improved transit service along the busy Van Nuys Boulevard and San Fernando Road corridors serving the eastern San Fernando Valley. The proposed project would extend from the Sylmar/San Fernando Metrolink Station on the north to the Metro Orange Line on the south and provide area residents, businesses, and transit-dependent populations with improved mobility and access to the regional transit system. Figure ES-1 shows the regional Los Angeles County Metropolitan Transportation Authority (Metro) transit lines expected to be operational by the year 2040 and illustrates how the East San Fernando Valley Transit Corridor Project would improve access to the regional system.

In addition to mobility benefits, the East San Fernando Valley Transit Corridor Project would provide the project area with transportation, economic, land use, and environmental benefits. The analyses presented in this Draft Environmental Impact Study/Environmental Impact Report (Draft EIS/EIR) documents the impacts to the environment that could occur due to the project, as required by federal National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) regulations. It also illustrates how improved mobility to and from the project area has the potential to boost economic development and improve social justice by providing better access to employment, educational and health facilities, and activity centers. Improved transit connectivity and service would also increase transit ridership, which in turn could result in environmental benefits due to reduced vehicle trips, reductions in vehicle miles traveled, less roadway congestion, and improved air quality.

The East San Fernando Valley Transit Corridor Project is included in the Southern California Association of Governments (SCAG) 2016-2040 Regional Transportation Plan /Sustainable Communities Strategy (RTP/SCS), adopted in April 2016. The RTP/SCS also outlines several projects in and around the project area aimed at maximizing the effectiveness, safety, and reliability of Southern California's transportation system.

Project milestones for the East San Fernando Valley Transit Corridor Project include:

- Publication of the Draft EIS/EIR
- Public review and comment on the Draft EIS/EIR (45 days following publication)
- Publication of the Final EIS/EIR – Release of the Final EIS/EIR document is based on the condition that funding is available to allow for construction of the project within three years after issuance of the Record of Decision (ROD)
- Metro Board of Directors approves a project and adopts a Mitigation Monitoring and Reporting Program (MMRP) and CEQA Findings

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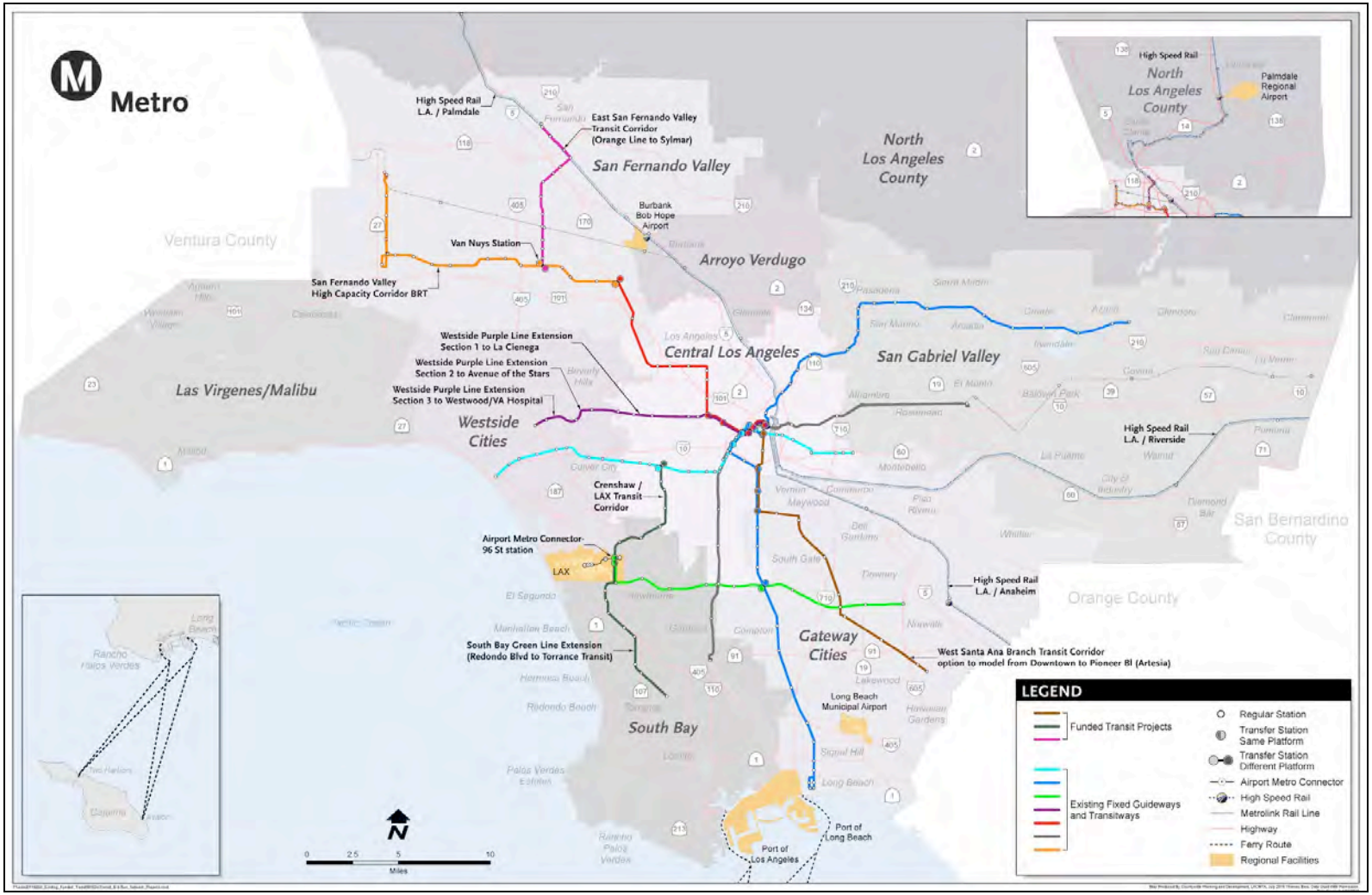
Figure ES-1: Existing and Proposed Regional BRT and Rail Lines



Source: Metro, 2016.

- California Environmental Quality Act (CEQA) Notice of Determination (NOD)
- Federal Transit Administration (FTA) approves Record of Decision (ROD). Following the Federal ROD, the proposed project can proceed to final design, construction, and operation. The schedule of these milestones will be refined as the project nears the end of the state and federal mandated environmental review process.

ES.2 Purpose and Need

Purpose

The East San Fernando Valley Transit Corridor Project would provide new service and/or infrastructure that would improve passenger mobility and connectivity to regional activity centers, increase transit service efficiency (speeds and passenger throughput), and make transit service more environmentally beneficial via reductions in greenhouse gas emissions.

The purposes of the proposed project are summarized as follows:

- Improve mobility in the eastern San Fernando Valley by introducing an improved north-south transit connection between key transit hubs/routes;
- Enhance transit accessibility/connectivity for residents within the study area to local and regional destinations;
- Provide more reliable transit service within the eastern San Fernando Valley;
- Provide additional transit options in an area with a large transit-dependent population, including the disabled, high-transit ridership; and
- Encourage modal shift to transit in the eastern San Fernando Valley, thereby improving air quality.

Need

The following mobility challenges within the project study area will continue to grow if no action is taken, due, in large part, to continued population growth, which increases the demand for transit service along the Van Nuys Boulevard corridor, a corridor that already has high population density and transit-dependent persons who rely on transit for daily transportation, including commuting:

- **Mobility challenges resulting from increased roadway congestion, affecting study area bus service** - Based on the Metro travel forecast model, the number of congested roadway segments (a portion of the roadway located between two intersections) in the study area is expected to increase from 126 to 162, a 29 percent increase in the AM peak hour and from 103 to 159, a 54 percent increase in the PM peak hour. Average speeds on these segments are expected to decrease by up to 12 miles per hour (mph) during the AM and PM peak hours. The increase in congested segments will result in lower vehicle speeds and increased travel delay in the study area, reducing mobility. Based on travel projections from the Metro model, the number of study intersections currently operating at LOS E or F along the Van Nuys Boulevard corridor will more than double by the year 2040.

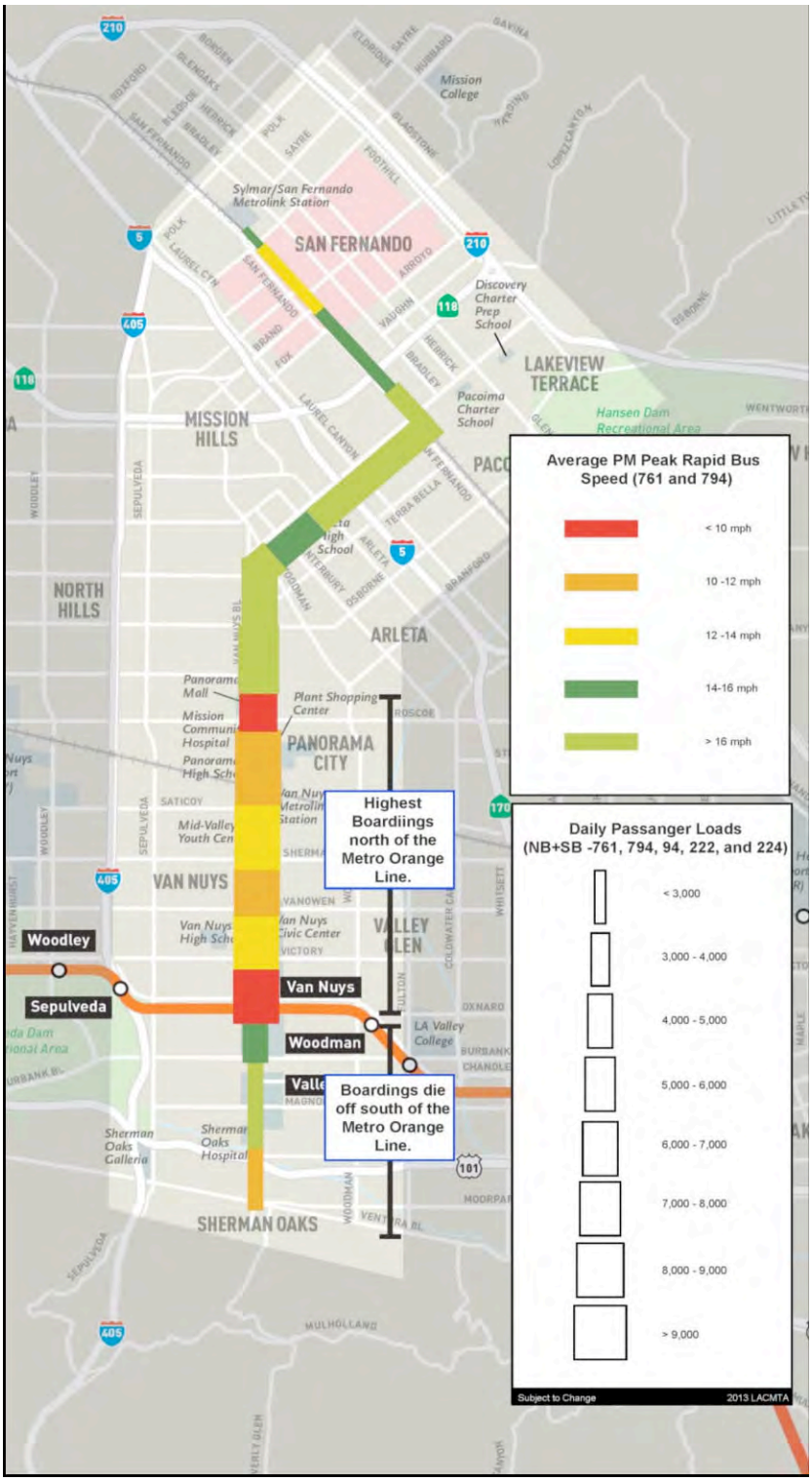
Photo ES-1 shows typical existing congested conditions along the corridor.

Photo ES-1: Existing Congestion on Van Nuys Boulevard Corridor

Source: Metro, 2016.

- **Increasing travel demand** - According to the Metro model, the person-trip distribution for the project study area indicates that a high number of travel trips tend to be localized to the communities within the area. Approximately 50 percent of the trips stay within the study area, with a large portion of trips occurring between the northern communities of the City of San Fernando and Pacoima and the southern communities of Mission Hills and Panorama City. These southern communities have a higher number of activity centers that include Kaiser Permanente Hospital, several high schools, and the Panorama Mall. A significant proportion of the overall study area trip distribution is to and from the Van Nuys Civic Center area, as demonstrated in Figure ES-2, constituting approximately 52 percent of all study area trips. These general trip trends are expected to remain similar in 2040 and show a high attraction of trips between the central study area and the Civic Center area. Because of the centralized trip patterns, transit accessibility and connectivity are integral to study area resident travel needs, especially to those who are transit dependent (35 percent). A total of 10 percent of households do not own a car and the average adult poverty ratio is 2.26 persons per acre compared to 1.08 per acre for Los Angeles County. These residents rely on Metro and City of Los Angeles Department of Transportation bus services for work and non-work trips within the study area and the greater Los Angeles County area. By 2040, the trip pattern is expected to remain similar, with a high number of trips (approximately 50 percent) staying within the study area. Local trips will remain a significant contributor to traffic and transit trends. Therefore, providing enhanced transit connections and accessibility to surrounding destinations is critical for residents that rely on public transit.
- **Transit service performance and reliability is decreasing due to increased** congestion - The existing bus service along the study area corridors does not meet the Metro on-time performance goal of 80 percent. This is directly correlated to levels of roadway congestion and related vehicular speeds, which together reduce the mobility of area bus riders. As congestion continues to increase, the reliability of bus service for riders will also worsen, because further congestion will further decrease bus speeds.

Figure ES-2: Existing Bus Boarding Distribution for Van Nuys Boulevard Corridor



Source: Metro, 2016.

- **Large transit-dependent population and expected growth in ridership** - The Van Nuys Boulevard corridor has the seventh highest total transit boardings on the Metro Bus system. This corridor is served by Rapid Line 761 and Local Line 233, which have combined passenger boardings that are the second highest in the San Fernando Valley, with the Metro Orange Line boardings at a slightly higher number. Sepulveda Boulevard and San Fernando Road also have some of the highest total boardings of all transit corridors in the San Fernando Valley. The demand in passenger boardings is constituted by both transit dependent and discretionary riders. The overall population density and the transit dependent population density are both more than twice as high in the study area as in the urbanized area of the County as a whole. The study area average of 0.53 zero-vehicle households per acre is 77 percent higher than the 0.30 County average. The study area average transit dependent population of 7.04 persons per acre is more than 100 percent higher than the 3.21 County average. The study area average of 2.26 adult persons below the poverty line per acre is over two times the 1.08 County average. Although population density and transit dependent population characteristics are expected to stay the same or improve slightly, study area population is expected to increase by almost 12 percent by the year 2040, and area employment will increase by approximately 15 percent. With the increase in population and employment growth, it is likely that there will be an increase in bus crowding (Photo ES-2).

Photo ES-2: Existing Bus Crowding

Source: Metro, 2016.

- **Exceeding air quality criteria pollutant standards within the study area** - Standards for many of the criteria pollutants monitored within the east San Fernando Valley have been exceeded multiple times during each of the previous three years of collected data (2010 – 2012). The traffic analysis indicates that travel speeds, vehicular delay, and congestion will worsen by 2040. This will result in increased gas consumption, and vehicle emissions in the study area. The increase in delay at the study intersections is expected to increase vehicle emissions and fuel consumption.

ES.3 Alternatives Considered

The following six alternatives include the No-Build Alternative, Transportation Systems Management (TSM) Alternative, two Bus Rapid Transit (BRT) alternatives, and two rail alternatives are evaluated in this Draft EIS/EIR:

- No-Build Alternative
- TSM Alternative
- BRT Alternatives
  - Alternative 1 – Curb-Running BRT Alternative
  - Alternative 2 – Median-Running BRT Alternative
- Rail Alternatives
  - Alternative 3 – Low-Floor Light Rail Transit (LRT)/Tram Alternative
  - Alternative 4 – LRT Alternative

All build alternatives (Alternatives 1 through 4) would operate over 9.2 miles, either in a dedicated bus lane or guideway (6.7 miles) and/or in mixed-flow traffic lanes (2.5 miles), from the Sylmar/San Fernando Metrolink station on the north to the Van Nuys Metro Orange Line station on the south, with the exception of Alternative 4, which includes a 2.5-mile segment within Metro-owned railroad right-of-way adjacent to San Fernando Road and Truman Street and a 2.5-mile underground segment beneath portions of the City of Los Angeles communities of Panorama City and Van Nuys.

No-Build Alternative

The No-Build Alternative represents projected conditions in 2040 without implementation of the project (Figure ES-1). No new transportation infrastructure would be built within the project study area, aside from projects that are currently under construction or funded for construction and operation by 2040. These projects include highway and transit projects funded by Measure R and specified in the current constrained element of the *Metro 2009 Long-Range Transportation Plan* (LRTP) and the 2016 Southern California Association of Governments (SCAG) *Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS). Existing infrastructure and future planned and funded projects assumed under the No-Build Alternative include:

- Existing Freeways – Interstate 5, and Interstate 405, State Route 118, and U.S. 101;
- Existing Transitway – Metro Orange Line;
- Existing Bus Service – Metro Rapid and Metro Local Service;
- Los Angeles Department of Transportation Commuter Express, and DASH;
- Existing and Planned Bicycle Projects – Bicycle facilities on Van Nuys Boulevard and connecting east/west facilities; and
- Other Planned Projects – Various freeway and arterial roadway upgrades, upgrades to the Metrolink system and the proposed California High-Speed Rail Project.

This alternative establishes a baseline for comparison to other alternatives in terms of potential environmental effects, including adverse and beneficial environmental effects.

TSM Alternative

The TSM Alternative emphasizes transportation systems upgrades, which may include relatively low-cost transit service improvements such as increased bus frequencies and minor modifications to the roadway network. Additional TSM Alternative transit improvements that may be considered include, but are not limited to traffic signalization improvements, bus stop amenities/ improvements, and bus schedule restructuring.

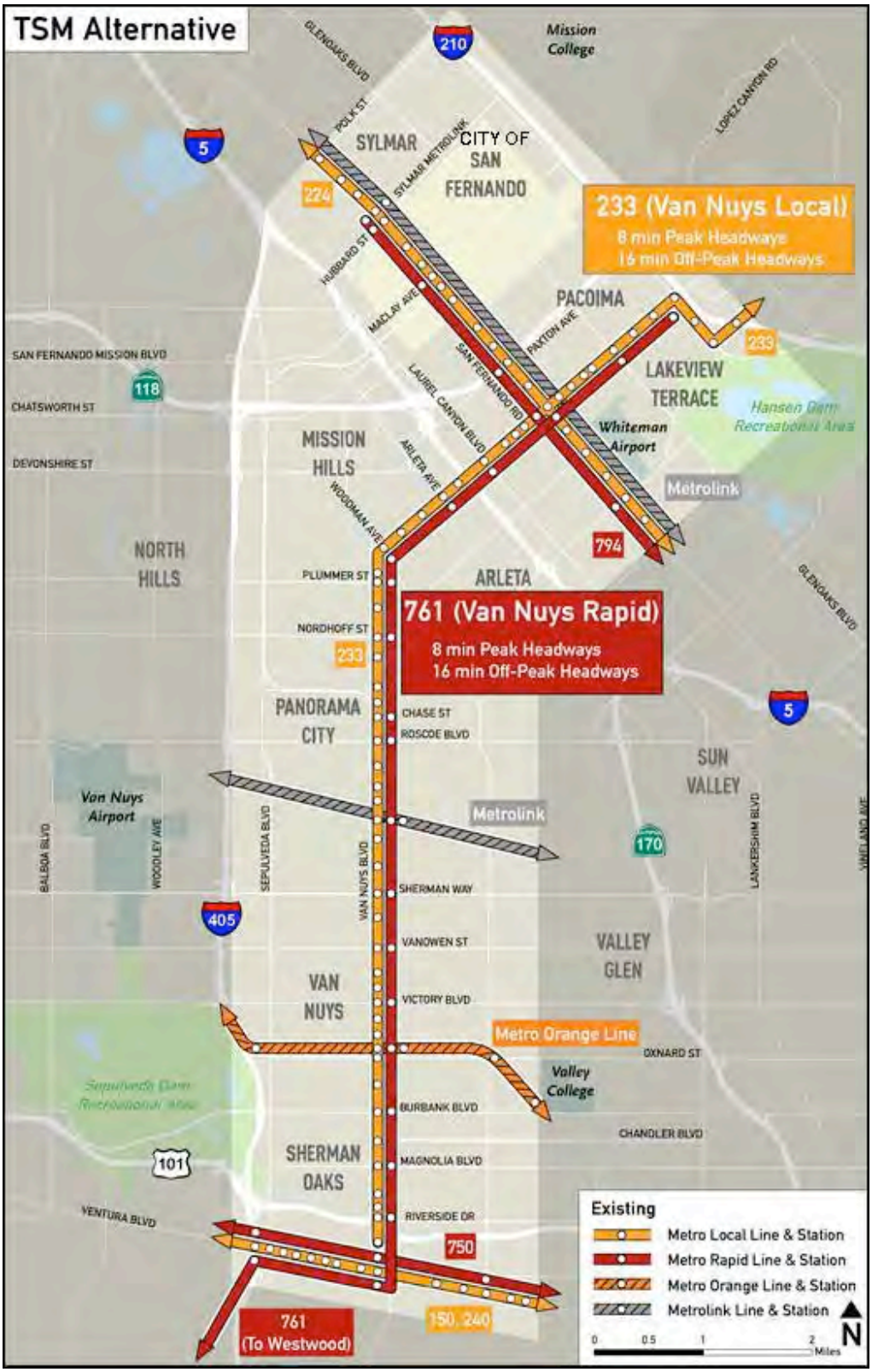
The TSM Alternative could include enhanced operating hours and increased bus frequencies for Rapid Line 761 and Local Line 233. Under this Alternative, the Metro Rapid Line 761 and Metro Local Line 233 bus routes would retain existing stop locations (see Figure ES-3). It would not change the existing bus operations on San Fernando Road, including those of Metro Local Line 244 and Metro Rapid Line 794. This alternative would add 20 additional buses to the existing Metro Local 233 and Metro Rapid 761 bus routes. These buses would be similar to existing Metro 60-foot articulated buses (shown in Photo ES-3), and each bus would have the capacity to serve up to 75 passengers (57 seats x 1.30 passenger loading standard). Buses would be equipped with transit signal priority equipment to allow for improved operations and on-time performance.

It should be noted that modifications were made in December 2014 to one of the primary Metro bus routes operating on Van Nuys Boulevard after this project analysis was already underway. Metro Rapid Line 744 was added connecting Pacoima in the east to Northridge in the west, and traveling for a large portion of the route (north-south) along Van Nuys Boulevard, and replacing the Metro Rapid Line 761. For the purposes of this study, the evaluation was based on the routes (Metro Rapid Line 761 and Metro Local Line 233) that were already in place in 2012 when the transportation modeling for this study began.

Photo ES-3: Example of Metro 60-Foot Articulated Bus

Source: Metro Transportation Library and Archives, 2015.

Figure ES-3: TSM Alternative



Source: STV, 2014.

The existing Metro Division 15 Maintenance and Storage facility (MSF) located in Sun Valley would be able to accommodate the 20 additional buses with the implementation of the TSM Alternative. Operational changes would include reduced headway (elapsed time between buses) times for Metro Rapid Line 761 and Metro Local Line 233, as follows:

- Metro Rapid Line 761 would operate with headways reduced from 10 minutes to 8 minutes during peak hours (7 a.m. to 9 a.m. and 4 p.m. to 7 p.m. on weekdays) and from 17.5 minutes to 12 minutes during off-peak hours.
- Metro Local Line 233 would operate with headways reduced from 12 minutes to 8 minutes during peak hours and from 20 minutes to 16 minutes during off-peak hours.

BRT Alternatives

Alternative 1 – Curb-Running BRT Alternative

Under the Curb-Running BRT Alternative, the BRT guideway would incorporate 6.7 miles of existing curb lanes (i.e., lanes closest to the curb) along Van Nuys Boulevard between San Fernando Road on the north and the Metro Orange Line on the south. This alternative would be similar to the Metro Wilshire BRT Project with a dedicated bus lane that could operate 24-hours a day or only during peak periods. The lanes would be dedicated curb-running bus lanes for Metro Rapid Line 761 and Metro Local Line 233, and for other transit lines that operate on short segments of Van Nuys Boulevard. In addition, this alternative would incorporate 2.5 miles of mixed-flow lanes, where buses would operate in the curb lane along San Fernando Road and Truman Street between Van Nuys Boulevard and Hubbard Avenue for Metro Line 761. Metro Line 233 would continue north on Van Nuys Boulevard to Lakeview Terrace. These improvements would result in an improved Metro Rapid Line 761 (hereafter referred to as 761X) and an improved Metro Local Line 233 (hereafter referred to as 233X). The route of the Curb-Running BRT Alternative is illustrated in Figure ES-4.

From the Sylmar/San Fernando Metrolink station:

- Metro Rapid Line 761X would operate within roadway travel lanes on Truman Street and San Fernando Road.
- At Van Nuys Boulevard, Metro Rapid Line 761X would turn southwest and travel south within a curb-running dedicated bus lane along Van Nuys Boulevard.
- The alternative would continue to be curb running along Van Nuys Boulevard until reaching the Metro Orange Line Van Nuys station where Metro Rapid Line 761X service would be integrated into mixed-flow traffic.
- Metro Line 761X would then continue south to Westwood as under existing conditions, though it should be noted that in December 2014 the Metro Rapid Line 761 was re-routed to travel from Van Nuys Boulevard to Ventura Boulevard, and then to Reseda Boulevard, while a new Metro Rapid Line 788 travels from Van Nuys Boulevard through the Sepulveda Pass to Westwood.

Metro Local Line 233X would operate similar to how it currently operates between the intersections of Van Nuys and Glenoaks Boulevards to the north and Van Nuys and Ventura Boulevards to the south. However, Metro Local Line 233X would operate with improvements over existing service because it would utilize the BRT guideway where its route overlaps with the guideway along Van Nuys Boulevard.

Figure ES-4: Alternative 1 – Curb-running BRT

Source: KOA and ICF International, 2014.

Transit service would not be confined to only the dedicated curb lanes. Buses would still have the option to operate within the remaining mixed-flow lanes to bypass right-turning vehicles, a bicyclist, or another bus at a bus stop.

The Curb-Running BRT Alternative would operate in dedicated bus lanes, sharing the lanes with bicycles and right turning vehicles. However, on San Fernando Road and Truman Street, no dedicated bus lanes would be provided. The Curb-Running BRT Alternative would include 18 bus stops.

Alternative 2 – Median-Running BRT Alternative

The Median-Running BRT Alternative consists of approximately 6.7 miles of dedicated median-running bus lanes between San Fernando Road and the Metro Orange Line, and would have operational standards similar to the Metro Orange Line. The remaining 2.5 miles would operate in mixed-flow traffic between the Sylmar/San Fernando Metrolink Station and San Fernando Road/Van Nuys Boulevard. The Median-Running BRT Alternative is illustrated in Figure ES-5.

Similar to the Curb-Running BRT Alternative, the Median-Running BRT (Metro Rapid Line 761X) would operate as follows from the Sylmar/San Fernando Metrolink station:

- Within mixed-flow lanes on Truman Street and San Fernando Road.
- At Van Nuys Boulevard, the route would turn southwest and travel south within the median of Van Nuys Boulevard in a new dedicated guideway.
- Upon reaching the Van Nuys Metro Orange Line Station, the dedicated guideway would end and the Rapid Line 761X service would then be integrated into mixed-flow traffic.
- The route would then continue south to Westwood, similar to the existing route. Similar to Alternative 1, it should be noted that in December 2014 the Metro Rapid Line 761 was re-routed to travel from Van Nuys Boulevard to Ventura Boulevard, and then to Reseda Boulevard, while a new Metro Rapid Line 788 travels from Van Nuys Boulevard through the Sepulveda Pass to Westwood.

Metro Local Line 233 would operate similar to existing conditions between the intersections of Van Nuys and Glenoaks Boulevards to the north and Van Nuys and Ventura Boulevards to the south. Rapid Bus stops that currently serve the 794 and 734 lines on the northern part of the alignment along Truman Street and San Fernando Road would be upgraded and have design enhancements that would be Americans with Disabilities Act (ADA) compliant. These stops would also serve the redirected 761X line:

1. Sylmar/San Fernando Metrolink Station
2. Hubbard Station
3. Maclay Station
4. Paxton Station
5. Van Nuys/San Fernando Station

Along the Van Nuys Boulevard segment, bus stop platforms would be constructed in the median. Seventeen median stations and four curb bus stops would be included.

Figure ES-5: Alternative 2 – Median-running BRT

Source: KOA and ICF International, 2014.

Rail Alternatives

Alternative 3 – Low-Floor LRT/Tram Alternative

The Low-Floor LRT/Tram Alternative would operate along a 9.2-mile route from the Sylmar/San Fernando Metrolink station to the north to the Van Nuys Metro Orange Line station to the south. The Low-Floor LRT/Tram Alternative would operate in a median dedicated guideway for approximately 6.7 miles along Van Nuys Boulevard between San Fernando Road and the Van Nuys Metro Orange Line station. The Low-Floor LRT/Tram Alternative would operate in mixed-flow traffic lanes on San Fernando Road between the intersection of San Fernando Road/Van Nuys Boulevard and just north of Wolfskill Street. Between Wolfskill Street and the Sylmar/San Fernando Metrolink station, the Low-Floor LRT/Tram would operate in a median dedicated guideway. It would include 28 stations. The route of the Low-Floor LRT/Tram Alternative is illustrated in Figure ES-6.

The Low-Floor LRT/Tram Alternative would operate along the following route:

- From the Sylmar/San Fernando Metrolink station, the Low-Floor LRT/Tram would operate within a median dedicated guideway on San Fernando Road.
- At Wolfskill Street, the Low-Floor LRT/Tram would operate within mixed-flow travel lanes on San Fernando Road to Van Nuys Boulevard.
- At Van Nuys Boulevard, the Low-Floor LRT/Tram would turn southwest and travel south within the median of Van Nuys Boulevard in a new dedicated guideway.
- The Low-Floor LRT/Tram would continue to operate in the median along Van Nuys Boulevard until reaching its terminus at the Van Nuys Metro Orange Line Station.

Based on Metro's *Operations Plan for the East San Fernando Valley Transit Corridor Project,* the Low-Floor LRT/Tram Alternative would assume a similar travel speed as the Median-Running BRT Alternative, with speed improvements of 18 percent during peak hours/peak direction and 15 percent during off-peak hours.

The Low-Floor LRT/Tram Alternative would operate using low-floor articulated vehicles that would be electrically powered by overhead wires, as in the example shown in Photo ES-4. This Alternative would include supporting facilities, such as an overhead contact system (OCS), traction power substations (TPSS), signaling, and a maintenance and storage facility (MSF).

Because the Low-Floor LRT/Tram Alternative would fulfill the current functions of the existing Metro Rapid Line 761 and Metro Local Line 233, these bus routes would be modified to maintain service only to areas outside of the project corridor. Thus, Metro Rapid Line 761 (referred to as 761S with reduced service) would operate only between the Metro Orange Line and Westwood, and Metro Local Line 233 (referred to as 233S with reduced service) would operate only between San Fernando Road and Glenoaks Boulevard. It is most likely that this area would continue to be served by a neighboring bus line or that the 233S route is modified, so that it is not serving such a limited geographic area. Metro Operations would make such modifications based on observation of the line's performance and feedback from the communities it serves. It should be noted that in December 2014 the Metro Rapid Line 761 was re-routed to travel from Van Nuys Boulevard to Ventura Boulevard, and then to Reseda Boulevard, while a new Metro Rapid Line 788 now travels from Van Nuys Boulevard through the Sepulveda Pass to Westwood and provides peak period freeway express service.

Figure ES-6: Alternative 3 – Low-Floor LRT/Tram

Source: KOA and ICF International, 2014.

Photo ES-4: Examples of Low-Floor LRT/Tram Vehicle Types

Portland Streetcar Tram Vehicle/Siemens S70 Low-Floor LRT Vehicle on Portland's MAX System

San Diego Trolley Siemens S70 Low-Floor LRT Vehicle/Stadler Variotram in Munich, Germany

Stations for the Low-Floor LRT/Tram Alternative would be constructed at various intervals along the entire route. There are portions of the route where stations would be closer together and other portions where they would be located further apart. With the Low-Floor LRT/Tram Alternative, 28 ADA compliant stations are proposed.

Alternative 4 – LRT Alternative

Similar to the Low-Floor LRT/Tram Alternative, the LRT would be powered by overhead electrical wires; however, it is relevant to note the onboard commuter load capacities for Alternatives 3 and 4. A low-floor and high-floor LRT vehicle have different load capacities, 100 versus 133, respectively. Using the San Diego Trolley low-floor vehicle as an example, their 90-foot low-floor vehicle has a commute/load capacity of 100 persons. Additionally, aisles are narrower and include step(s) to get to some/many seats. Additionally, seats above 'trucks' have less leg room. The low floor combined with the area dedicated to the trucks/wheels and the longer cab areas result in reduced capacity. For comparison, Metro's 90-foot high-floor model has a commute/load capacity of 133 passengers, and is the vehicle type that would likely be used for Alternative 4 (shown in Photos ES-5 and ES-6).

Photo ES-5: Example of Metro 90-Foot LRT Vehicle

Source: Metro, 2016.

Photo ES-6: Metro LRT Vehicle

Source: Metro, 2016.

Under Alternative 4, the LRT would travel in a dedicated guideway from the Sylmar/San Fernando Metrolink station adjacent to San Fernando Road south to Van Nuys Boulevard, from San Fernando Road to the Van Nuys Metro Orange Line Station, over a distance of approximately 9.2 miles (Figure ES-7). The LRT Alternative includes a segment in exclusive right-of-way through the Antelope Valley Metrolink railroad corridor, a segment with semi-exclusive right-of-way in the middle of Van Nuys Boulevard, and an underground segment beneath Van Nuys Boulevard from just north of Parthenia Street to Hart Street.

Figure ES-7: Alternative 4 – LRT

Source: KOA and ICF International, 2014.

The LRT Alternative would be similar to other street-running LRT lines that currently operate in the Los Angeles area, such as the Metro Blue Line, Metro Gold Line, and Metro Exposition Line. The LRT would travel along the median for most of the route, with a subway of approximately 2.5 miles in length between Vanowen Street and Nordhoff Street. On the surface-running segment, the LRT Alternative would operate at prevailing traffic speeds and would be controlled by standard traffic signals.

Stations would be constructed at approximately 1-mile intervals along the entire route. There would be 14 stations, three of which would be underground at locations near Sherman Way, the Van Nuys Metrolink station, and Roscoe Boulevard. Entry to the three underground stations would be provided from an entry plaza and portal. The entry portals would provide access to stairs, escalators, and elevators leading to an underground LRT station mezzanine level, which, in turn, would be connected via additional stairs, escalators, and elevators to the underground LRT station platforms

Similar to the Low-Floor LRT/Tram Alternative, the LRT Alternative would require a number of additional elements to support vehicle operations, including an OCS, TPSS, communications and signaling buildings, and a MSF.

ES.4 Comparison of Alternatives

Physical and operating characteristics of alternatives evaluated in this Draft EIS/EIR are summarized in Figure ES-8. The environmental effects of the alternatives are summarized in Table ES-1. The selection of criteria to evaluate the alternatives is based on their effectiveness in providing transit improvements that meet the project objectives, as reflected in the project purpose and need, while taking into account each alternative's environmental impacts, including effects on project area circulation and access, safety, property acquisition, and displacement, as well as the operating performance of each alternative and cost. The criteria are listed below.

- Travel and Mobility Benefits and Impacts;
- Regional Connectivity;
- Cost-Effectiveness;
- Environmental Benefits and Impacts;
- Economic and Land Use Considerations;
- Community Input; and
- Financial Capability.

Summary of Environmental Impacts

In compliance with NEPA and CEQA guidelines, this Draft EIS/EIR studied potential environmental consequences associated with construction and operation of the Alternatives described above.

Figure ES-8: Comparison of Alternatives

EAST SAN FERNANDO VALLEY TRANSIT CORRIDOR PROJECT

COMPARISION OF ALTERNATIVES

CONSIDERATIONS *	NO BUILD	TSM	CURB RUNNING BRT Alternative 1	MEDIAN RUNNING BRT Alternative 2	MEDIAN RUNNING TRAM Alternative 3	MEDIAN RUNNING LRT Alternative 4
LEFT-TURN RESTRICTIONS AT CERTAIN INTERSECTIONS	–	–	–	✓	✓	✓
STREET PARKING RESTRICTIONS	–	–	✓	✓	✓	✓
FUTURE BIKE LANE RESTRICTIONS	–	–	✓	✓	✓	✓
REDUCES CURRENT SIDEWALK WIDTHS	–	–	–	✓	✓	✓
TRAVEL LANES IN EACH DIRECTION	3	3	2	2	2	2
POTENTIAL REAL ESTATE ACQUISITION	–	–	–	–	✓	✓
REQUIRES NEW RAIL MAINTENANCE STORAGE FACILITY (MSF)	–	–	–	–	✓	✓
2040 OPERATIONAL CHARACTERISTICS *						
AVERAGE SPEED (MPH)	11.3	11.3	13.4	15.0	13.1	19.2
TRAVEL TIME (MINUTES)	49	48	41	37	42	29
CAPITAL COSTS IN 2014 $ (APPROXIMATE) $170 MILLION CURRENTLY IDENTIFIED	–	$ 35.2 M	$294 M	$402 M	$1.3 B	$2.67 - $2.79 B
CAPACITY PER VEHICLE	75	75	75	75	266	400

*SUBJECT TO CHANGE

Source: Metro, 2015.

Due to the highly urbanized nature of the project area, potential environmental impacts pertain primarily to the built environment. Over 20 categories of environmental impacts were evaluated. Environmental impact categories where at least one alternative would have a substantial adverse effect or significant impact remaining after mitigation are discussed below under unavoidable substantial adverse effects/significant impacts remaining after mitigation. Table ES-1 summarizes effects/impacts, mitigation measures, and impacts remaining after mitigation associated with each alternative.

Unavoidable Substantial Adverse Effects/Significant Impacts

At least one of the alternatives (see Table ES-1) would have unavoidable adverse effects/significant impacts on the following environmental resources:

Traffic and Bicycle Facilities: The build alternatives, Alternatives 1 through 4, would result in reductions in roadway capacity due to the conversion of existing motor vehicle lanes to accommodate the BRT and rail alternatives. As a consequence, significant traffic impacts could occur at 16 to 32 study intersections, depending on the alternative. Mitigation measures such as lane configuration changes that would increase capacity of the roadways or restrictions in allowable turning movements, were considered infeasible due to right-of-way (ROW) constraints or secondary effects to upstream and downstream locations. Since no feasible mitigation measures exist that would reduce these impacts below the level of significance, impacts would be significant and unavoidable. Additionally, existing bicycle lanes on Van Nuys Boulevard would be removed and future bicycle lanes designated for implementation along Van Nuys Boulevard would not be feasible under the build alternatives, which would conflict with the City of Los Angeles Bicycle Plan. Therefore, impacts on bicyclists and bicycle facilities would remain significant.

Community and Neighborhood: The unavoidable significant adverse impacts described above due to removal of bicycle lanes would also be considered a significant adverse community and neighborhood impact. Additionally, under Alternatives 3 and 4, construction and operational impacts on social and community interactions due to business displacements, and operational visual impacts on sensitive viewers would be significant after implementation of proposed mitigation measures.

Visual and Aesthetics: Alternatives 3 and 4 would result in potentially significant impacts to the visual environment within the project corridor. The visual changes in communities along the project corridor due to the introduction of new vertical structures affecting scenic views of the surrounding mountains and foothills would result in an adverse effect under NEPA and a significant impact under CEQA after mitigation.

Air Quality: Construction of Alternatives 1 through 4 would result in localized PM10 and PM2.5 emissions during construction that would exceed local thresholds. Even with implementation of mitigation measures, emissions thresholds would be exceeded and impacts would remain significant during construction.

Safety and Security: Implementation of Alternative 1 would result in impacts, after mitigation, on bicycle safety due to the removal of existing bike lanes. In addition, Alternatives 2 through 4 would result in impacts, after mitigation, on pedestrian sidewalk safety due to narrowing of sidewalks, bicycle safety due to the removal of existing bike lanes, and potential impacts on emergency vehicle response time due to turn restrictions and the increased congestion resulting from the removal of mixed-flow travel lanes.

More information regarding the proposed project's environmental impacts is provided in Chapter 3, Transportation Impacts and Mitigation, and Chapter 4, Environmental Analysis, Consequences, and Mitigation. All impacts and mitigation measures associated with each alternative are summarized below in Table ES-1.

ES.5 Issues to Be Resolved and Areas of Controversy

Areas of Controversy

Public comments submitted during the scoping period expressed concerns regarding the issues listed below. Please note that these comments are meant to provide a synopsis of the top trending themes. A detailed description of the comments received during the scoping period is provided in Appendix CC, the Final Scoping Report.

- A strong preference by the public for LRT, despite the high cost, which is viewed as the best mode of transit, with higher carrying capacity and better mobility benefits;
- A feeling among some community members that the San Fernando Valley is not receiving its fair share of investment in rail, compared to other parts of the county;
- Concerns expressed about the effects on local businesses of removing on-street parking along Van Nuys Boulevard;
- Concerns about economic impacts on adjacent businesses during project construction;
- Concerns over the loss of traffic lanes to accommodate the project and increased congestion in the motor vehicle lanes due to the project;
- Strong opposition to extending the project limits south of the Metro Orange Line, by community members south of the Metro Orange Line;
- Concerns about the location of the maintenance facility and potential impacts on the surrounding community;
- Concerns that BRT would be slower, carry fewer people, and have limited benefits compared with LRT;
- Concerns that LRT is too expensive and BRT can provide almost the same level of benefits at a much lower cost;
- Concerns about any potential elimination of existing Metro Local and Rapid bus routes and stops;
- Strong support for inclusion of bicycle lanes as part of this project, and opposition to their removal; and
- Concerns about fare increases to pay for this project.

Issues to Be Resolved

Operating Characteristics of Alternative 3 within Downtown San Fernando

If Alternative 3, the Low-Floor LRT/Tram Alternative is selected as the preferred alternative, Metro would continue to coordinate with the City of San Fernando regarding mutually agreeable operating characteristics, such as operating the alignment within a median/dedicated guideway on San Fernando Road and developing an appropriate design that is compatible and appropriate for this multi-modal corridor. Potential operating and design issues to be considered include transit, automobile, and pedestrian access and safety issues as well as pedestrian bridge implementation, lane removal, tree removal, OCS pole installation, and tram station designs and locations.

Connection with Metro Orange Line

The Metro Orange Line intersects the southern terminus of the alignment (shown in Photo ES-7). Currently, the Metro Orange Line is a BRT that operates in a dedicated right-of-way with an average of 30,000 boardings per day. The Metro Orange Line Van Nuys Station is also a major transfer point. In planning this project, special consideration should be given to how this project intersects with the Metro Orange Line and how to best facilitate transfer to/from both services.

Photo ES-7: Existing Metro Orange Line Connection with Van Nuys Boulevard

Source: KOA, 2015.

Uncertainties and Opportunities with California High Speed Rail

California's High-Speed Rail (CAHSR) Project is in the planning phase, and could potentially include a segment near or within the proposed project study area (Figure ES-9). If the CAHSR alignment plans progress with a preferred alignment in the vicinity of the proposed project area, coordination with the California High-Speed Rail Authority would continue to occur to ensure that the CAHSR Project does not conflict with this planned proposed project.

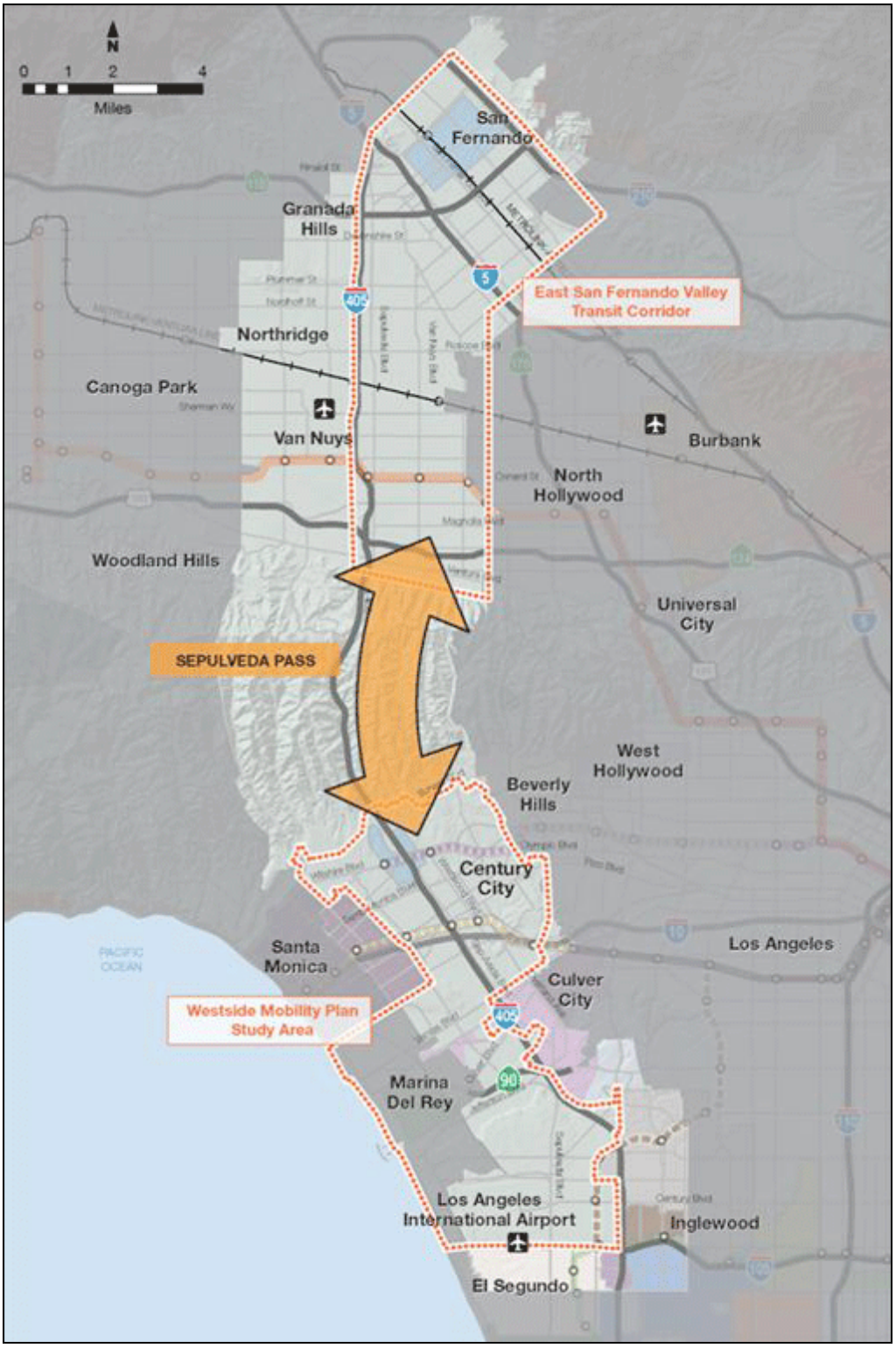
Figure ES-9: Possible California High Speed Rail Planned within the Study Area

Source: State of California High Speed Rail Authority, 2016.

Uncertainties and Opportunities with Sepulveda Pass Transit Project

Along with planning for this proposed project, Metro is also studying how best to provide improved transit service through the Sepulveda Pass connecting the San Fernando Valley and the Westside (e.g. Westwood, Brentwood, West LA, Culver City). Selection of a preferred alternative for the East San Fernando Valley Transit Corridor Project will recognize the Sepuleveda Pass Project and consider any potentially feasible and advanatagous points for connecting the two corridors (Figure ES-10).

Figure ES-10: Sepulveda Pass Transit Connection



Source: Metro, 2016.

Bus Shelters and City Bus Shelter Advertising Contracts

Any proposed changes to the existing bus shelters (Photos ES-8) and benches as part of the proposed project would need to be coordinated and approved in consultation with the City of Los Angeles. Since the City has an exclusive contract with a bus stop advertising company and proposed project changes would have to be coordinated per the City's contract.

Photo ES-8: Bus Shelter/Bus Shelter Advertising

Source: Google Maps, 2016.

Specific Effects on Landmark Palm Trees in the Civic Center

One of the most noticeable visual elements along the Van Nuys Boulevard corridor is the dual row of palm trees in the Van Nuys Civic Center portion of the corridor (Photo ES-9). The impact assessment for the median-running BRT and both LRT alternatives indicated that the guideway requirements would require the removal of some portion of these trees. It is Metro's intent to hold focused community urban design and station area meetings during final design of the project to obtain input on the re-planting of the trees. The community will be informed during the meetings about drought-tolerant California native plants and trees that could be considered for sun protection/shade as part of the landscaping plan that would be developed during final design.

Photo ES-9: Landmark Palm Trees along Van Nuys Boulevard in the Van Nuys Civic Center

Source: Metro, 2016.

Specific Effects on Mature Trees in the City of San Fernando's Downtown

One of the most noticeable visual elements along San Fernando Road through downtown San Fernando is the mature street trees on each side of the street (shown in Photo ES-10). The impact assessment for the Low-Floor LRT /Tram Alternative indicated that the guideway requirements would require the removal of some portion of these trees. It is Metro's intent to hold focused community urban design and station area meetings to obtain input on the re-planting of the trees with final design of the project. The community will be informed during the meetings about drought-tolerant California native plants and trees that could be considered for sun protection/shade as part of the landscaping plan that would be developed during final design.

Photo ES-10: Mature Trees along San Fernando Boulevard in Downtown San Fernando

Source: Metro, 2016.

Pedestrian Safety Improvements at Nearby Schools

A number of private and public schools are either adjacent to or near Van Nuys Boulevard and the San Fernando Road corridors (Photos ES-11 through ES-13). The Metro Board will need to consider whether additional pedestrian safety measures are warranted, beyond Metro's current pedestrian safety program.

Photo ES-11: San Fernando Middle School

Source: Google Maps, 2016.

Photo ES-12: Arleta High School

Source: Google Maps, 2016.

Photo ES-13: Panorama High School

Source: Google Maps, 2016.

Specific Effects of Project on Left Turns into Businesses

Alternatives 2, 3, and 4 would eliminate some mid-block, or outside of intersection left-turns into properties on Van Nuys Boulevard. There are businesses throughout the corridor where delivery trucks access the business via a left turn (Photo ES-14). A formal outreach effort would be established to work with the businesses on a new access plan that would continue to provide access while being compatible with the operation of a median-running alternative, should one be the selected alternative.

Photo ES-14: Truck Making a Left Turn along Van Nuys Corridor

Source: Metro, 2016.

Project Funding

Capital Funding Sources

Metro's approved 2009 LRTP reserved $170.1 million for the project, which is the present worth in 2014 dollars, escalated to the year of expenditure. The following combination of federal, state, and local revenue sources are eligible sources of funding for the East San Fernando Valley Transit Corridor Project:

- **Federal Sources**
  - Congestion Management and Air Quality (CMAQ)
  - Regional Surface Transportation Program (RSTP)
  - Other future FTA funding
- **State Sources**
  - Regional Improvement Program (RIP)
  - Traffic Congestion Relief Program (TCRP)
  - Cap and Trade
- **Local Sources**
  - Measure R Sales Tax
  - Local Agency Funds
  - Proposition A Sales Tax
  - Proposition C Sales Tax

2016 Transportation Sales Tax Ballot Measure

Los Angeles County is expected to grow by 2.4 million people by 2057. Metro is updating its Long Range Transportation Plan (LRTP) to enhance mobility and quality of life for Los Angeles County to position the region for future growth and meet transportation needs. The foundation for the updated LRTP is a transportation sales tax ballot measure which provides a vision, through nine categories of funding for the variety of transit related infrastructure and programs needed to build and operate a balanced multi-modal transportation system. Specifically, the potential ballot measure identifies major highway and transit projects evaluated and sequenced based on performance metrics approved by the Metro Board of Directors at its December 2015 meeting. The potential ballot measure also includes projects identified by staff that are necessary to improve and enhance system connectivity; promote bicycling and walking; support Americans with Disabilities Act (ADA)/paratransit services for the disabled; discounts for students and seniors; investments to fund bus and rail operations; ongoing system maintenance and repair, including repair of bridges and tunnels; and funds for repair and enhancement of local streets and roads. To fund these projects and programs, the Metro Board agreed, at its June 2016 meeting, to place a measure on the ballot in November 2016 that would augment Measure R with a new half-cent sales tax, and extend the current Measure R tax rate to 2057.

In March 2016, the Metro Board released the draft Potential Ballot Measure Expenditure Plan for public review. The draft Plan anticipates approximately $120+ billion (year of expenditure (YOE)) over a 40+ year period. It relies on the following funding assumptions: a ½ cent sales tax augmentation to begin in FY18; an extension of an existing ½ cent sales tax rate beyond the current expiration of Measure R in 2039; with a combined one cent sales tax sunset in the year 2057 and a partial extension for ongoing repairs, operations, and debt service. The draft Expenditure Plan currently identifies the East San Fernando Valley Transit Corridor Project for a total of $1.33 billion in funding, including $810 million of potential ballot measure revenues and $520 million of funding from other LRTP revenues. The project as defined in the draft Expenditure Plan would be a high-capacity transit project, mode to be determined, that connects the Orange Line Van Nuys Station to the Sylmar/San Fernando Metrolink Station with a minimum of 14 stations over 9.2 miles.

LRTP Priority Projects

In order to accelerate a project in the LRTP, the funds must be available and the Metro Board must approve an amendment to the 2009 LRTP. Metro is currently working to update the LRTP, which will include the approval of the East San Fernando Valley Transit Corridor Project, its new schedule and its new funding. When this occurs and the new dates of construction are known, if warranted, a supplemental environmental analysis will be conducted.

ES.6 Next Steps

- Draft EIS/EIR Comment Period – A 45-day comment period will begin with publication of the Notice of Availability of the Draft EIS/EIR.
- Metro Board adopts the Locally Preferred Alternative – The Metro Board of Directors may choose to select a Locally Preferred Alternative (LPA) in the spring of 2017.
- Upon adoption of the LPA, the Metro Board may initiate the Final EIR. FTA's approval to initiate the Final EIS may be contingent upon having funding in place. The Metro Board must obtain funds to allow the initiation of a Final EIS as described above in Issues to be Resolved.

ES.7 Summary of Environmental Consequences and Mitigation Measures

Metro is committed to satisfying applicable federal, state, and local environmental regulations and to applying reasonable mitigation measures to reduce adverse effects and significant impacts. Measures to mitigate potential effects and impacts for the project alternatives are identified in this Draft EIS/EIR. Metro Board of Directors authorizes the completion of the Final EIR when they approve a project alternative, the Board will also adopt a Mitigation Monitoring and Reporting Program (MMRP), which lists all of the committed mitigation measures and CEQA Findings. Upon approval of the proposed project, these mitigation measures will become part of the proposed project, and will be considered binding under CEQA.

Table ES-1, below, provides a summary of all the impacts and mitigation measures associated with each alternative.

Table ES-1: Summary of Environmental Impacts and Mitigation Measures

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Transportation, Transit, Circulation, and Parking							
Construction	**Transit:** It's expected that the minor improvements under the TSM Alternative would not require lane or road closures or detours that could adversely affect transit operations. **Traffic:** Construction would be temporary and short in duration. No road closures would be required. **Parking:** Construction would be very limited in scope and short in duration. It's anticipated few if any parking spaces would be affected. **Pedestrian and Bicycle Facilities:** Construction would not require removal of existing bike lanes or narrowing of sidewalks.	**Transit:** Construction would occur in phases, within separate work zones, over an approximately 18-month period. **Traffic:** Temporary lane and street closures may be required for limited periods of time. **Parking:** From 7 a.m. to 7 p.m., on-street parking would be removed within each construction work zone. On-street parking would be permanently removed to accommodate operation of Alternative 1 (However, nighttime parking and off-peak parking may be considered). **Pedestrian and Bicycle Facilities:** Existing bicycle lanes along Van Nuys Boulevard would be removed during construction. Pedestrian routes would be lengthened where minor intersections would be temporarily closed during construction.	Alternative 2 would result in greater impacts (due to a longer construction period of approximately 24 months) than to those that would occur under Alternative 1.	**Transit and Traffic:** Alternative 3 would be constructed over a period of approximately 4 years and would result in temporary lane or street closures. Due to the magnitude and duration of construction, impacts would be significant under CEQA and adverse under NEPA **Parking and Pedestrian and Bicycle Facilities:** Impacts would be the same as those that would occur under Alternatives 1 and 2.	**Transit and Traffic:** Construction of Alternative 4 could take up to 5 years. The impacts would be greater than those that would occur under Alternative 3. **Parking and Pedestrian and Bicycle Facilities:** Impacts would be the same as those that would occur under Alternatives 1 to 3.	**TSM Alternative:** None required. **Alternatives 1 through 4:** **MM-TRA-1:** To ensure potential impacts to pedestrian and bicycle facilities are minimized to the extent feasible, the Traffic Management Plan and Traffic Control Plans shall include the following: • Bicycle detour signs shall be provided, as appropriate, to route bicyclists away from detour areas with minimal-width travel lanes and onto parallel roadways. • Sidewalk closure and pedestrian route detour signs shall be provided, as appropriate, that would safely route pedestrians around work areas where sidewalks would be closed for safety reasons or for specific construction work within the sidewalk area. In addition, the project contractor shall ensure appropriate "Open During Construction," wayfinding, and promotional signage for businesses affected by sidewalk closures are provided and access to these businesses is maintained. **Alternatives 2 through 4:** A Traffic Management Plan (TMP) will be developed and implemented by the construction contractor in coordination with Metro, Los Angeles Department of Transportation (LADOT), and the City of San Fernando. The TMP shall include requirements for changeable message signs, when they should be placed (how far in advance of construction) and where they should be placed (how far outside of the construction zone). **MM-TRA-4:** The Traffic Management Plan shall require Metro to communicate closures and information on any changes to bus service to local transit agencies in advance and develop detours as appropriate. Bus stops within work areas shall be relocated, with warning signs posted in advance of the closure, and warnings and alternate stop notifications posted during the extent of the closure. **MM-TRA-5:** The TMP shall consider including the following typical measures, and others as appropriate: • Schedule a majority of construction-related travel (i.e., deliveries, hauling, and worker trips) during the off-peak hours;	**TSM Alternative:** **CEQA:** Beneficial; no impacts **NEPA:** Beneficial; no adverse effects **Alternatives 1 and 2:** **CEQA:** Significant (bicycle facilities) **NEPA:** Adverse (bicycle facilities) **Alternatives 3 and 4:** **CEQA:** Significant (transit, traffic, bicycle facilities) **NEPA:** Adverse (transit, traffic, bicycle facilities)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						• Develop detour routes to facilitate traffic movement through construction zones without significantly increasing cut-through traffic in adjacent residential areas; • Where feasible, temporarily restripe roadways including turning lanes, through lanes, and parking lanes at the affected intersections to maximize the vehicular capacity at those locations affected by construction closures; • Where feasible, temporarily remove on-street parking to maximize the vehicular capacity at those locations affected by construction closures; In these areas where street parking is temporarily removed in front of businesses, the contractor shall provide wayfinding to other nearby parking lots or temporary lots, with any temporary parking secured well in advance of parking being removed in the affected area. • Where feasible, place station traffic control officers at major intersections during peak hours to minimize delays related to construction activities; • Assign a Construction Relations team inclusive of a manager, senior officers, and social media strategist to develop and implement the Metro Board's adopted Construction Relations model. The team will conduct the an outreach program to inform the general public about the construction process and, planned roadway closures and anticipated mitigations through community briefings in public meeting spaces and use of signage (banners, etc.); • Develop and implement a program with business owners to minimize effects to businesses during construction activities, including but not limited to signage, Eat, Shop, Play, and promotional programs; • Consult and seek input on the designation and identification of haul routes and hours of operation for trucks with the local jurisdictions and Caltrans. The selected routes should minimize noise, vibration, and other effects; • To the extent practical, maintain traffic lanes in both directions, particularly during the morning and afternoon peak hours; • Maintain access to adjacent businesses via existing or temporary driveways throughout the construction period; and • Coordinate potential road closures and detour routes with local school districts.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Operation	**Transit:** The TSM Alternative would improve bus headways and result in an increase of 466 daily transit trips on Van Nuys Boulevard. **Traffic**: The TSM Alternative would not cause the levels of service (LOS) at study intersections to worsen by a measurable amount. **Parking:** No parking would be removed under the TSM Alternative. **Pedestrian and Bicycle Facilities:** The TSM Alternative does not propose any physical or operational changes to pedestrian and bicycle facilities.	**Transit Impacts:** Alternative 1 would result in improved bus headways and an increase of 2,970 daily transit trips. **Traffic Impacts**: Alternative 1 would result in significant LOS impacts at 16 of the 73 study intersections in the AM or PM peak hours due to conversion of the curb lane to dedicated BRT lane. Vehicle miles traveled (VMT) and vehicle hours traveled (VHT) would be higher than the TSM Alternative and Alternative 3 but lower than Alternatives 2 or 4. **Parking:** All on-street parking spaces along Van Nuys Boulevard would be prohibited from being used from early morning to early evening to accommodate operation of the BRT. Adequate replacement parking exists on adjacent streets or in off-street parking. **Pedestrian and Bicycle Facilities:** Existing bicycle lanes on Van Nuys Boulevard would be removed and future bicycle lanes designated for implementation along Van Nuys Boulevard would not be feasible under Alternative 1. Pedestrian routes would be lengthened where minor intersections would be closed. Remaining pedestrian crossings would be improved with enhanced design and safety features.	**Transit Impacts:** Alternative 2 would result in improved bus headways, faster bus speeds, and an increase of 2,969 daily transit trips. **Traffic Impacts**: Alternative 2 would result in significant LOS impacts at 24 of the 73 study intersections in the AM or PM peak hours. Average vehicle speeds would slightly improve over the No-Build Alternative. VMT and VHT values would be greater than those under the TSM Alternative and Alternative 1, but would not be greater than Alternatives 3 and 4. **Parking:** All 1,140 on-street parking spaces would be removed. Impacts would be the same as those that would occur under Alternative 1. **Pedestrian and Bicycle Facilities:** Impacts would be the same as those that would occur under Alternative 1.	**Transit Impacts:** Alternative 3 would result in improved headways and travel times, and an increase of 8,452 daily transit trips. Local bus service along Van Nuys Boulevard would be replaced by Low-Floor LRT/Tram service. **Traffic Impacts**: Alternative 3 would result in significant LOS impacts at 16 (under Existing plus Alternative 3 scenario) or 32 (under future Alternative 3 scenario) of the 73 study intersections in the AM or PM peak hours. Average vehicle speeds would slightly improve over the No-Build Alternative. This alternative would also result in reductions in VMT and VHT although these reductions would not be as great as those that would occur under the BRT alternatives and Alternative 4. **Parking and Pedestrian and Bicycle Facilities:** All 1,140 on-street parking spaces and 15 adjacent cross-street spaces would be removed. Impacts would be the same as those that would occur under Alternatives 1 and 2.	**Transit Impacts:** Alternative 4 would result in improved headways and travel times, and an increase of 8,604 daily transit trips. **Traffic Impacts**: Alternative 4 would result in significant impacts at 20 of the 73 study intersections in the AM or PM peak hours. **Parking:** A total of 902 on-street parking spaces and 528 off-street parking spaces would be removed. **Pedestrian and Bicycle Facilities:** Impacts would be the same as those described for Alternatives 1 to 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** **MM-TRA-2**: Additional visual enhancements, such as high visibility crosswalks that meet current LADOT design standards, to the existing crosswalks at each proposed station location shall be implemented to further improve pedestrian circulation. **MM-TRA-3:** To further reduce potential non-adverse and less than significant pedestrian impacts, Metro shall prepare a community linkages study that would document preferred pedestrian access to each station, general pedestrian circulation in the immediate vicinity of the station, and potential sites for connections to nearby bus services. The purpose of this study would include ensuring sufficient circulation, access, and information important to users of the transit system. The results of the study shall be implemented through coordination between Metro and the local jurisdictions of the City of Los Angeles and the City of San Fernando. The following general mitigation measures is proposed to reduce or minimize potential impacts to bicycle facilities as a result of implementation operation of Alternative 1:	**TSM Alternative:** **CEQA:** Beneficial; no impacts **NEPA:** Beneficial; no adverse effects **Alternatives 1 through 4:** **CEQA:** Beneficial; less than significant impact; significant (traffic; bicycle facilities) **NEPA:** Beneficial; no adverse effect; adverse (traffic, bicycle facilities)
Cumulative Impacts	Since the TSM Alternative would not result in adverse impacts, it would not contribute to any significant cumulative transit, traffic, parking, and pedestrian or bicycle facilities impacts.	Given construction would be temporary, resulting in short-term lane, road, or sidewalk closures within individual work zones, construction of Alternative 1 would not contribute to significant cumulative traffic or parking impacts. Operational effects of Alternative 1, combined with traffic from future growth and development, would result in increased delay at a number of study intersections in the corridor. The removal of bicycle lanes could result in significant cumulative lane impacts if other planned or proposed projects would also remove lanes or preclude development of future planned lanes.	Cumulative impacts would be slightly greater (traffic impacts at study intersections) than those that would occur under Alternative 1.	Cumulative impacts would be slightly greater (traffic impacts at study intersections) than those that would occur under Alternatives 1 and 2.	Cumulative impacts would be slightly greater than the other build alternatives (Alternatives 1 to 3).	See mitigation measures above.	**TSM Alternative:** **CEQA:** No impacts **NEPA:** No adverse effects **Alternatives 1 through 4:** **CEQA:** Less than significant impact; significant (traffic; bicycle facilities) **NEPA:** No adverse effect; adverse (traffic; bicycle facilities)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Land Use							
Construction	**Division of an Established Community:** This alternative proposes no new transportation or infrastructure improvements. It would not introduce physical barriers that would divide the existing communities surrounding the project corridor. **Conflict with Local Land Use Plans:** Construction activities would not conflict with applicable land use plans or habitat conservation plans environmental policies. **Incompatibility with Adjacent or Surrounding Land Uses:** The minor construction activities that could occur under this alternative would not be inconsistent with local plans or incompatible with existing land uses.	**Division of an Established Community:** Construction could require temporary road, lane, and sidewalk closures, which could reduce pedestrian and vehicle mobility and access within and between local communities throughout the study area. However, these temporary closures are not expected to substantially divide or diminish access to existing communities or neighborhoods. **Conflict with Local Land Use Plans:** Construction activities would not conflict with applicable land use plans or habitat conservation plans environmental policies. **Incompatibility with Adjacent or Surrounding Land Uses:** Construction activities along the alignment could result in temporary nuisance impacts (e.g., noise, air quality impacts) on nearby land uses. Additionally, construction staging areas would be established near the project alignment and used for equipment and material storage.	**Division of an Established Community:** Impacts would be the same as the impacts anticipated to occur under Alternative 1. **Conflict with Local Land Use Plans:** Impacts anticipated to occur under this alternative would be the same as impacts described for Alternative 1. **Incompatibility with Adjacent or Surrounding Land Uses:** Impacts would be the same as impacts described for Alternative 1.	**Division of an Established Community:** Lane and street closures could be greater in number than both BRT alternatives, due to the construction of additional infrastructure (e.g., OCS, dedicated guideway). However, these temporary closures are not expected to substantially divide or diminish access to existing communities or neighborhoods. **Conflict with Local Land Use Plans:** Impacts would be potentially greater in extent than the impacts described for Alternative 1 and 2 due to the more extensive construction under this alternative compared to Alternatives 1 and 2. **Incompatibility with Adjacent or Surrounding Land Uses:** Impacts would be greater in extent than the impacts that would occur under Alternatives 1 and 2.	**Division of an Established Community:** Impacts would be greater in extent than the impacts described for Alternative 3, due to the greater construction impacts along the subway portion of the alignment. **Conflict with Local Land Use Plans:** Impacts would be the same as the impacts described for Alternatives 1, 2, and 3. **Incompatibility with Adjacent or Surrounding Land Uses:** Impacts would be the same as the impacts described for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** Please see other sections (e.g., 4.8 the Noise and Vibration, 4.6 and Air Quality) sections of this table below, for the list of Noise and Vibration and Air Quality measures, respectively, measures to mitigate potentially significant adverse construction impacts on sensitive land uses near proposed construction activities.	**TSM Alternative:** **CEQA:** No impacts **NEPA:** No adverse effects **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Operation	**Division of an Established Community:** This alternative would operate entirely within existing transportation corridors and would not introduce physical barriers that would divide the existing communities surrounding the project corridor. **Conflict with Local Land Use Plans:** The TSM Alternative would involve transportation system upgrades, and would not conflict with local land use plans goals and policies. **Incompatibility with Adjacent or Surrounding Land Uses:** Under the TSM Alternative, Metro Rapid Line 761 and Local Line 233 bus routes would retain existing stop locations, and the existing stops	**Division of an Established Community:** Alternative 1 would operate entirely within existing transportation corridors, and would not introduce physical barriers that would divide the existing communities surrounding the project corridor. By providing improved bus transit service, this alternative would increase mobility and connectivity within the eastern San Fernando Valley area. **Conflict with Local Land Use Plans:** Alternative 1 would be consistent with or supportive of many of the goals and policies of the applicable jurisdictions along the project corridor. However, Alternative 1 could also result in significant adverse traffic impacts at some locations where a	**Division of an Established Community:** Impacts would be the same as the impacts anticipated to occur under Alternative 1. **Conflict with Local Land Use Plans:** Impacts would be slightly greater in extent than the impacts anticipated to occur under Alternative 1. Significant traffic impacts could occur at 24 of the 73 study intersections versus 16 of 73 study intersections under Alternative 1. Therefore, Alternative 2would conflict with local land use plan policies or objectives to reduce congestion **Incompatibility with Adjacent or Surrounding Land Uses:** Impacts would be the same as the impacts anticipated to occur under Alternative 1.	**Division of an Established Community:** Impacts would be slightly greater than those described for Alternatives 1 and 2. Notwithstanding turn and pedestrian crossing restrictions, given that the Alternative 3 alignment would be located along existing roadways and the fact that pedestrians and vehicles could still cross the alignment at specified locations throughout the corridor, this alternative would not divide an established community. **Conflict with Local Land Use Plans:** Impacts would be slightly greater in magnitude than the impacts described for Alternatives 1 and 2.	**Division of an Established Community:** Impacts would be the same as the impacts described for Alternative 3. **Conflict with Local Land Use Plans:** Impacts would be the same as the impacts described for Alternative 3. **Incompatibility with Adjacent or Surrounding Land Uses:** Impacts would be the same as the impacts described for Alternative 3, with the exception of the subway portion of the alignment. Alternative 4 would also require right-of-way acquisition of commercial properties and some vacant land near the proposed stations.	**TSM, Alternatives 1 and 2:** None required **Alternative 3 and 4:** Please see Section 4.8 –the Noise and Vibration section of this table below for a list of measures to mitigate potential operational noise and vibration impacts to sensitive land uses.	**TSM Alternative:** **CEQA:** No impacts **NEPA:** No adverse effects **Alternatives 1 through 4:** **CEQA:** Significant and unavoidable (conflict with local land use plans related to traffic congestion) **NEPA:** Adverse effect (conflict wit local land use plans related to traffic congestion)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
	along San Fernando Road would remain unchanged. In addition, this alternative would not require the construction or expansion of an MSF, as the existing Metro Division 15 facility would be able to accommodate the 20 additional buses needed for this alternative. Therefore, development patterns would not be affected, and incompatible land uses would not occur as a result of this alternative.	reduction in the number of mixed-flow travel lanes is necessary to accommodate a dedicated BRT lane. The localized traffic impacts under Alternative 1 would conflict with the congestion reduction goals and policies of local plans. Additionally, while bicycle lanes along Van Nuys Boulevard would not be possible under this alternative, the ability for bicyclists to access areas in the project corridor would be retained, and the project would achieve other local planning goals of reducing reliance on the automobile and increasing transit ridership. **Incompatibility with Adjacent or Surrounding Land Uses:** While there would be some modifications to the project corridor (e.g., changes in bicycle lanes and turning movements), the project corridor is an existing transportation route with ongoing bus transit service; therefore, the proposed BRT operations would be compatible with existing land uses. Under this alternative, 18 stations would be located in areas that contain primarily commercial and residential uses. Stations would include aesthetic enhancements, such as landscaping and canopies, which would be compatible with adjacent and surrounding land uses.		**Incompatibility with Adjacent or Surrounding Land Uses:** While there would be some modifications to the project corridor (e.g., changes in bicycle lanes and tuning movements), the project corridor is an existing transportation route with ongoing bus transit service, and therefore, proposed Low-floor LRT/Tram operations would generally be compatible with existing land uses. This alternative would require an OCS that would not conflict with adjacent and surrounding uses. Under this alternative, 28 stations would be in areas that are primarily commercial and residential. Stations would include aesthetic enhancements, such as landscaping, canopies, and artwork, which would be compatible with adjacent and surrounding land uses. Construction of a new MSF would be required and would generally be compatible with adjacent and surrounding land uses. This alternative would also require TPSSs, which would be typically placed approximately every 1.0 to 1.5 miles. To ensure compatibility with adjacent and surrounding land uses to the extent feasible, the majority of potential TPSS locations would be located near potential stations or the maintenance facility options.			
Cumulative Impacts	During construction and operation, the TSM Alternative would not conflict with land use plans or policies, would not divide an established community, and would not be incompatible with nearby land uses; therefore, the TSM Alternative would not contribute to any significant cumulative land use impacts.	During construction, with the implementation of a Traffic Management Plan and a Construction Phasing and Staging Plan, temporary effects and impacts would be further reduced. As a consequence and because impacts would be temporary, the proposed project combined with other related projects in the study area, are not expected to result in significant cumulative construction impacts/effects under CEQA and NEPA. During operation, the proposed project and other related projects in the area that generate	Impacts would be slightly greater (due to additional traffic impacts) than those described for Alternative 1.	The cumulative impacts would be slightly greater than those described for Alternatives 1 and 2. The proposed project and potential related projects in the area that would generate traffic that could result in significant cumulative traffic impacts, which would conflict with local plans and policies. Under operation, the proposed and related projects could result in a significant land use impact with respect to conflicts with local land use plans and incompatibilities with adjacent and surrounding land uses.	The cumulative impacts would be the same as those described for Alternative 3.	Please see Section 4.6 Air Quality and Section 4.8 Noise and Vibration for a list of mitigation measure to mitigate potential air quality and noise and vibration impacts.	**TSM Alternative:** None required. No impact under CEQA and no adverse effect under NEPA. **Alternatives 1 through 4:** Significant under CEQA and Adverse under NEPA. (Operation)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
		additional traffic could cumulatively conflict with local land use plan goals and policies to reduce congestion, a potentially significant impact under CEQA.					
Economic and Fiscal Impacts							
Construction	The TSM Alternative would require no parcel acquisitions and consequently construction would result in no adverse economic or fiscal impacts or effects.	This alternative would require no parcel acquisitions. Other than potential minor economic impacts on local businesses due to reduced visibility (due to sign blockage) and diminished access resulting from temporary sidewalk or lane closures, loss of on-street parking during construction, and permanent removal of on-street parking to accommodate the Alternative 1 alignment, no adverse fiscal and economic impacts would occur.	Adverse economic and fiscal impacts would be limited to potential impacts on local businesses due to reduced visibility (e.g., sign blockage) and diminished access resulting from sidewalk or lane closures, loss of on-street parking during construction, and permanent removal of on-street parking spaces to accommodate the Alternative 2 alignment.	Alternative 3 could also result in potential minor economic impacts on local businesses due to reduced visibility and diminished access resulting from sidewalk or lane closures, loss of on-street parking during construction, and permanent removal of on-street parking spaces. Parcel acquisitions for the guideway, stations, TPSS, and MSF are summarized in tables 4.3-9 through 4.3-11 in this EIS/EIR.	Alternative 4 could also result in potential minor economic impacts on local businesses due to reduced visibility and diminished access resulting from sidewalk or lane closures, loss of on-street parking during construction, and permanent removal of on-street parking spaces. Parcel acquisitions for the guideway, stations, TPSS, and MSF are summarized in tables 4.3-12 through 4.3-14 in this EIS/EIR.	**TSM Alternative, Alternatives 1 and 2:** None Required. **Alternatives 3 and 4:** See traffic measures above.	**TSM Alternative, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Operation	The TSM Alternative would result in no adverse operational economic or fiscal impacts.	Operational economic and fiscal impacts would be limited to the potential indirect impacts on local businesses due to diminished access that could occur where on-street parking would be removed to accommodate the Curb-Running BRT Alternative. No other adverse operational economic and fiscal impacts would occur.	Operational impacts would be the same as those described above for Alternative 1.	Operational economic and fiscal impacts would be limited to the potential indirect impacts on local businesses due to diminished access that could occur where on-street parking would be removed to accommodate the Alternative 3 – Low Floor LRT/Tram alignment. No other adverse operational economic and fiscal impacts would occur.	Operational economic and fiscal impacts would be limited to the potential indirect impacts on local businesses. No other adverse operational economic and fiscal impacts would occur.	**TSM Alternative, Alternatives 1 and 2:** None Required. **Alternatives 3 and 4:** None required. Also, see Traffic mitigation measures identified above and Communities and Neighborhoods mitigation measures below for a list of measures to mimize impacts on local businesses. .	**TSM Alternative, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Cumulative	The TSM Alternative would not require acquisition of properties and consequently would not result in direct adverse effects that could contribute to cumulative adverse economic and fiscal impacts.	This alternative would not require acquisition of properties and consequently would not result in direct adverse effects that could contribute to cumulative adverse economic and fiscal impacts. The indirect economic and fiscal effects due to Curb-Running Build Alternative would be minimal and can be further reduced with implementation of mitigation measures; therefore, the Curb-Running Alternative would not contribute to any significant adverse cumulative fiscal and economic impacts.	The Median-Running BRT Alternative would not require acquisition of properties and consequently would not result in direct adverse effects that could contribute to cumulative adverse economic and fiscal impacts.	Alternative 3, in conjunction with related projects that require the acquisition of parcels and result in the long-term loss of income-generating jobs and tax revenue, could result in adverse cumulative economic and fiscal impacts under NEPA. However, the related projects identified within the study area do not include any other major public infrastructure projects that would result in permanent loss of tax revenue or jobs. Because of the more localized nature of a Low-Floor LRT/Tram system, compared with a more regional serving LRT, it is not expected that this alternative would generate significant cumulative growth inducement impacts.	The cumulative impacts would be the same as those described for Alternative 3, with the execption being that Alternative 4 has a greater potential to be growth inducing due to its higher carrying capacity, faster average speed, and generally higher per capita transit ridership	**TSM Alternative, Alternatives 1 through 4:** None Required.	**TSM Alternative, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Communities and Neighborhoods							
Construction	The TSM Alternative may include minor bus stop and roadway improvements as well as operational enhancements to the existing bus system. The limited extent of physical improvements would likely have no or very minimal impacts.	**Mobility and Access Impacts:** Temporary sidewalk, lane, and possibly road closures, and removal of parking on Van Nuys, San Fernando Road, and their cross streets could reduce pedestrian, bicycle, and vehicle mobility during construction. These closures, as well as traffic pattern disruptions, could reduce public access to annual community festivals and events, as well as decrease access for emergency vehicles and a delay in response times. **Social and Economic Impacts:** Social and economic impacts would be minimal. Construction jobs would be temporary. Construction activities may decrease accessibility to businesses and some consumers may avoid the area. Land use patterns or physical division of communities would be short-term and not substantial. However, noise, dust, odors, and traffic delays may cause temporary inconvenience during construction. **Physical Impacts:** Visual impacts could occur due to temporary removal of vegetation from some areas. Public safety and security may be temporarily affected.	Construction impacts would be the same as those for Alternative 1.	With the addition of OCS, TPSSs, and an MSF, construction impacts for Alternative 3 may be more extensive than those described for the BRT alternatives. **Social and Economic Impacts:** Construction may require additional permanent right-of-way acquisitions and the permanent displacement of businesses. Displaced businesses would be relocated to nearby properties, which may temporarily affect local business viability while customers become accustomed to accessing new locations. Additionally, these locations may be psychologically or socially disruptive to neighborhood residents or visitors, and may cause public controversy among community members and business owners. However, this would not divide an established community.	Alternative 4 would require the most extensive construction of the four build alternatives because of the subway portion of the alignment. Alternative 4would include construction of OCS, TPSSs, and MSF structures. The types and level of significance of the impacts would be the same as those described for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** Please see the Transportation, Transit, Circulation, and Parking; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security sections of this table for a list of mitigation measures to minimize construction impacts on communities and neighborhoods. In addition, the following measure is proposed for Alternatives 3 and 4: **MM-CN-1**: A formal educational and public outreach campaign shall be implemented to discuss potential community and neighborhood concerns, including relocations, visual/aesthetics changes, and fare policies, and to communicate information about the project with property owners and community members.	**TSM Alternative:** **CEQA:** Less than significant or beneficial impacts **NEPA:** No adverse effects or beneficial effects **Alternatives 1 and 2:** **CEQA:** Less than significant **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant; significant (social and community interactions due to business displacements) **NEPA:** No adverse; adverse (social and community interactions due to business displacements)
Operation	**Mobility and Access Impacts** The TSM Alternative is expected to result in beneficial changes to existing mobility and access to businesses and community resources with enhanced bus frequencies. Emergency vehicle access would benefit due to reduced traffic congestion. However, with the limited physical and operational improvements in the TSM Alternative, community mobility would likely deteriorate due to traffic congestion from regional growth in the future. The TSM is not expected to result in substantial social and economic changes, though a small number of jobs would be created. The	**Mobility and Access Impacts** Mobility would be enhanced and access to businesses and community resources would be improved. **Social and Economic Impacts** This alternative would not be expected to induce substantial population or business growth in existing communities and neighborhoods. Enhanced transit service and increased pedestrian traffic near proposed stations could stimulate the local economy by facilitating access to local businesses. Additional transit services would be expected to	Operational impacts would be the same as those described in Alternative 1, with exceptions noted below. **Mobility and Access Impacts** The Median-Running BRT alternative would require restrictions on motor vehicle movement (left turns). Modifications to pedestrian movements and sidewalk widths would not significantly interfere with pedestrian access. Bicycle access and safety impacts would be the same as those for Alternative 1.	Operational impacts would be the same as those described for Alternative 1, with the exceptions noted below. **Mobility and Access Impacts** Restrictions on motor vehicle movement (left turns) at unsignalized intersections and daytime curbside parking prohibition along Van Nuys Boulevard and San Fernando Road would present an inconvenience for vehicles traveling along the project corridor. This alternative would maintain pedestrian and bicycle access to the project corridor, though minor changes to	Operational impacts would be the same as those described for Alternative 1, with the exceptions noted below. **Mobility and Access Impacts** Under this alternative, vehicle movements and parking would be maintained along San Fernando Road and Truman Street, and restrictions on vehicle movements and loss of parking on Van Nuys Boulevard would be inconvenient, but access would be maintained. Pedestrian movement and sidewalk width modifications would not be	See mitigation measures listed in the Transportation, Transit, Circulation, and Parking; Visual Quality and Aesthetics; Noise and Vibration; and Safety and Security sections of this table that would be implemented to minimize operational impacts on communities and neighborhoods.	**TSM Alternative:** **CEQA:** Less than significant or beneficial impacts **NEPA:** No adverse effects or beneficial effects **Alternatives 1 and 2:** **CEQA:** Significant impact (bicycle access and safety) **NEPA:** Adverse effect (bicycle access and safety) **Alternatives 3 and 4:** **CEQA:** Less than significant; significant (social and community interactions from business displacements, visual impacts on sensitive viewers);

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
	alternative would have minimal physical impacts and would operate within existing transportation corridors.	enhance community cohesion and interaction and result in a long-term overall improved quality of life for communities and neighborhoods in the project area. **Physical Impacts** Alternative 1 would not result in substantial changes to land use patterns. This BRT alternative would be consistent with existing bus operations and land use patterns, although it may indirectly affect development by encouraging housing, employment, and commercial development in the area. Operation would not result in physical intrusions, but could create security concerns at station areas. Changes to traffic patterns may cause an initial increase in accidents, and the removal of existing Class II bike lanes would increase potential for bicycle and bus conflicts.	**Physical Impacts** A barrier fence along the length of the alignment would be installed to prevent pedestrian crossings of the BRT guideway, which could be considered a physical intrusion by the communities and neighborhoods in the project study area.	pedestrian and bicycle circulation would be required. These would not be expected to significantly interfere with pedestrian access along the corridor, although bicycle access and safety impacts would be the same as those in Alternatives 1 and 2. **Social and Economic Impacts** Some areas would require commercial property acquisitions to accommodate the Low-Floor LRT/Tram facilities. Full right-of-way acquisitions for the construction of the MSF would also be required, with three possible locations for the MSF. Displacements could result in substantial changes to local neighborhood character and potentially the social fabric of the local community, because neighborhood residents and visitors may be accustomed to accessing businesses in their existing locations and the displacement of those businesses could be psychologically or socially disruptive, and could affect professional and social interactions. If relocation sites are available within proximity to the existing business sites, the disruptions to professional and social interactions may be temporary as residents become accustomed to accessing the displaced businesses at their new locations. **Physical Impacts** Changes in the aesthetic character could be substantial in areas where sensitive viewers are located, including residents, pedestrians, and bicyclists. Alternative 3 would not be expected to introduce substantial physical intrusions, and operations would be consistent with existing transportation uses. Potential for accidents would be highest initially, but would stabilize as people become used to the new alignment. Stations could present safety hazards if pedestrian traffic and movement are not considered, and if pedestrians attempt to cross	expected to substantially interfere with pedestrian access along the project corridor. The Mission City Trail for bicycles would be maintained. Alternative 4 could result in bicycle access and safety impacts. **Social and Economic Impacts** Property acquisitions and displacements would be required to accommodate the LRT alignment and the MSF, with slightly different parcels affected. **Physical Impacts** Visual impacts on sensitive viewers and recreational users could be adverse. Pedestrian safety issues would mostly apply to proposed at-grade stations, and less to the proposed underground LRT facilities. Safety impacts within communities and neighborhoods in the project study area from the potential for bicycle collisions could be adverse.		Significant impact (bicycle access and safety) **NEPA:** No adverse; (social and community interactions from business displacements, visual impacts on sensitive viewers in communities and neighborhoods); Adverse effect (bicycle access and safety)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
				streets and tracks illegally. Alternative 3 could also result in safety impacts from the potential for bicycle collisions.			
Cumulative	The TSM Alternative would not result in adverse effects or would result in beneficial impacts on communities and thus would not contribute in any appreciable way to cumulative impacts.	Short-term and temporary impacts during construction would be less than cumulatively considerable. Operation would have some beneficial long-term effects for the community. However, cumulative impacts on local traffic circulation would be significant. Access and safety due to bicycle and vehicle collisions could be substantial, and could be cumulatively considerable when combined with other related projects in the project study area.	Cumulative impacts would be the same as those described for Alternative 1.	Since Alternative 3 would result in potentially significant operational impacts on social and community interactions due to business displacements, and potentially significant operational visual impacts on sensitive viewers, it could contribute to significant cumulative impacts on community cohesion and integration and aesthetic character, unlike the BRT alternatives.	Cumulative impacts would be the same as those described for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** Please see the Transportation, Transit, Circulation, and Parking; Real Estate and Acquisitions; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security sections of this table for a list of mitigation measures to minimize construction and operational impacts on communities and neighborhoods. See Chapter 3, Transportation, Transit, Circulation, and Parking; Section 4.5, Visual Quality and Aesthetics; Section 4.6, Air Quality; Section 4.8, Noise and Vibration; and Section 4.14, Safety and Security **Alternative 2:** See Chapter 3, Transportation, Transit, Circulation, and Parking; Section 4.5, Visual Quality and Aesthetics; Section 4.6, Air Quality; Section 4.8, Noise and Vibration; and Section 4.14, Safety and Security **Alternative 3:** See Chapter 3, Transportation, Transit, Circulation, and Parking; Section 4.2, Real Estate and Acquisitions; Section 4.5, Visual Quality and Aesthetics; Section 4.6, Air Quality; Section 4.8, Noise and Vibration; and Section 4.14, Safety and Security. In addition, see proposed mitigation measure MM-CN-1**.** **Alternative 4:** See Chapter 3, Transportation, Transit, Circulation, and Parking; Section 4.2, Real Estate and Acquisitions; Section 4.5, Visual Quality and Aesthetics; Section 4.6, Air Quality; Section 4.8, Noise and Vibration; and Section 4.14, Safety and Security. Also, see proposed mitigation measure MM-CN-1, listed in this column for construction a couple of rows above.	**TSM Alternative** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 1, 2, 3, and 4:** **CEQA:** Significant impact **NEPA:** Adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Visual Quality and Aesthetics							
Construction	The TSM Alternative would include limited physical improvements and result in very minimal impacts on visual and aesthetic resources.	This alternative could result in temporary visual impacts including cranes, bulldozers, graders, scrapers and other equipment visible to viewers in the construction area. Mature vegetation may be temporarily or permanently removed from some areas.	Construction impacts would be the same as those described for Alternative 1.	Construction impacts for Alternative 3 would be slightly greater than the BRT alternatives due to the construction of the OCS, TPSSs, a pedestrian bridge, an MSF, and larger station platforms.	Alternative 4 would result in the greatest construction impacts due to the subway portion of the alignment.	**TSM Alternative:** None required **Alternative 1 through 4:** **MM-VIS-1:** Construction staging shall be located away from residential and recreational areas, and shall be screened to minimize visual intrusion into the surrounding landscape. The screening shall be a height and type of material that is appropriate for the context of the surrounding land uses. There shall be Metro branded art and community-relevant messaging on the perimeter of the construction staging walls. Lighting within construction areas shall face downward and be designed to minimize spillover into adjacent properties.	**TSM, Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Operation	The TSM Alternative would include minor visual changes that would not adversely affect any existing scenic vistas, resources, or add any substantial sources of light or glare.	**Scenic Vistas:** Scenic vistas may be affected by station canopies, but other changes such as additional buses and widened sidewalks would not be expected to result in changes to scenic vistas. **Scenic Resources:** Existing scenic resources, including landscaping, would be preserved. **Visual Character and Quality:** Visual character and quality would be enhanced by the removal of parking along the outside curb lanes, station upgrades, sidewalk widening, and additional trees and benches. **Lighting, Glare, and Shading:** Station upgrades and additional buses may result in increased lighting, glare, and shading. Shading from bus station canopies would be a beneficial change for station users.	The addition of bus stop platforms and railings in the roadway median, a barrier along the median lanes, the addition of BRT vehicles, changes to parking and vehicle lands, and sidewalk widening would be added to those impacts identified for Alternative 1. Street trees would be removed along the corridor for implementation of this alternative, but the landmark trees within the Van Nuys Civic Center and downtown San Fernando would be minimally affected. The view of the corridor as a whole would not be substantially affected. Visual quality would increase slightly in this alternative.	**Scenic Vistas:** Adverse effects may occur due to new vertical features in the landscape, particularly the OCS. Narrowed sidewalks, the MSF, and the TPSSs would not be expected to substantially affect views. Overall impacts on scenic vistas could be adverse. **Scenic Resources:** Existing scenic resources, including landscaping, and street trees would be affected with this alternative, and in particular the mature trees found along San Fernando Road in the downtown San Fernando area. **Visual Character and Quality:** Visual character and quality would be affected by the Low-Floor LRT/Tram cars and new stations; however, views in the corridor as a whole would not be substantially affected. The MSF would have a similar industrial appearance to replaced buildings and thus would not have a substantial adverse effect on visual character and quality, though the TPSSs may slightly disrupt visual unity along the corridor. **Lighting, Glare, and Shading:** Lighting, glare, and shading would not change substantially except in residential areas where elements of this alternative could increase nighttime lighting.	**Scenic Vistas:** Scenic vistas may be affected by new LRT cars and OCS, median stations and fencing, railroad crossing gates, TPSSs, the pedestrian bridge, the MSF, and changes to parking, lanes and sidewalks. The OCS would substantially affect views, and other structures listed above. **Scenic Resources:** This alternative would affect landscaping, including street trees, such as the rows of palm trees along Van Nuys Boulevard in the Van Nuys Civic Center area. **Visual Character and Quality:** The LRT cars would affect the visual character of the project corridor, as the OCS would have a different appearance than existing buses. The MSF would have similar visual characteristics as surrounding commercial and industrial facilities. The TPSSs could slightly disrupt visual unity along the corridor, but the removal of parking along the outside curb lanes could enhance visual unity and quality. **Lighting, Glare, and Shading:** Lighting, glare, and shading would be the same as those described in Alternative 3.	**TSM Alternative:** None required **Alternative 1 through 4:** **MM-VIS-2:** Vegetation removal shall be minimized to the extent possible, and vegetation shall be replaced following construction either in-kind or following the landscaping design palette for the project, which would be prepared in consultation with the Cities, including the City Tree Removal Policy and replacement ratio. **MM-VIS-3:** Scenic resources, including historic properties and landscape elements such as rows of palm trees (along Van Nuys Boulevard) or mature trees (along San Fernando Road) and uniform lighting, shall be preserved, where feasible. **MM-VIS-4:** Lighting associated with the project shall be designed to face downward and minimize spillover lighting into adjacent properties, in particular residential and recreational properties. **MM-VIS-5:** Infrastructure elements shall be designed with materials that minimize glare.	**TSM, Alternatives 1 and 2:** **CEQA:** Less than significant or beneficial impact **NEPA:** No adverse effect or beneficial effect **Alternative 3:** **CEQA:** Significant **NEPA:** Adverse **Alternative 4:** **CEQA:** Potentially significant impact (scenic views, scenic resources, visual character); less than significant or beneficial impact (visual quality) **NEPA:** Adverse effect (scenic views, scenic resources, visual character); no adverse effect or beneficial effect (visual quality)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Cumulative	The TSM Alternative would have no or negligible adverse effects and thus would not contribute to cumulative impacts on visual or aesthetic resources.	During construction, this alternative would result in temporary adverse effects on visual and aesthetic resources. Operational impacts would be less than cumulatively considerable because views in the corridor as a whole would not be substantially affected.	The cumulative impacts for Alternative 2 would be the same as those described for Alternative 1.	The cumulative impacts for this alternative would be the same as those described for Alternative 1, except operational visual impacts may be significant for viewer groups in the vicinity of related projects that further degrade the visual character of the area.	The cumulative impacts for Alternative 4 would be to the same as those described for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** See MM-VIS-1 through MM-VIS-5 in the row above.	**TSM, Alternatives 1 and 2:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Significant impact (visual character and quality) **NEPA:** Adverse effect (visual character and quality)
Air Quality							
Construction	No or very minor amounts of criteria pollutant emissions or toxic air contaminant emissions would be generated.	Project construction under Alternative 1 would result in the short-term generation of criteria pollutant emissions. Emissions would include fugitive dust, hydrocarbon (reactive organic gas [ROG]), exhaust, and motor vehicle emissions, mostly associated with heavy equipment operations during construction. Localized emissions of particulate matter 10 microns in diameter or less (PM_{10}) and particulate matter 2.5 microns in diameter or less ($PM_{2.5}$) during construction would exceed local thresholds.	Project construction under Alternative 2 would result in the short-term generation of criteria pollutant emissions, the same as those described for Alternative 1.	Construction of Alternative 3 would result in the short-term generation of criteria pollutant emissions, as described for Alternative 1. It should be noted that Alternative 3 has a slightly longer construction period (at 24 months for air quality emission calculation purposes). Regional emissions for ROG and oxides of nitrogen (NOx) are expected to exceed the South Coast Air Quality Management District (SCAQMD) regional emissions thresholds. Localized PM_{10} and $PM_{2.5}$ emissions during construction would exceed local thresholds. The greatest potential for toxic air contaminant (TAC) emissions would be related to diesel particulate matter (DPM) emissions associated with operation of heavy construction equipment.	Construction of Alternative 4 would result in the short-term generation of criteria pollutant emissions, as described for Alternative 3.	**TSM Alternative:** None required. **Alternatives 1 through 4:** **MM-AQ-1**: Construction vehicle and equipment trips and use shall be minimized to the extent feasible and unnecessary idling of heavy equipment shall be avoided. **MM-AQ-2:** Solar powered, instead of diesel powered, changeable message signs shall be used. **MM-AQ-3:** Electricity from power poles, rather than from generators, shall be used where feasible. **MM-AQ-4:** Engines shall be maintained and tuned per manufacturer's specifications to perform at U.S. Environmental Protection Agency (EPA) certification levels and to perform at verified standards applicable to retrofit technologies. Periodic, unscheduled inspections shall be conducted to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. **MM-AQ-5:** Any tampering with engines shall be prohibited and continuing adherence to manufacturer's recommendations shall be required. **MM-AQ-6:** New, clean (diesel or retrofitted diesel) equipment meeting the most stringent applicable federal or state standards shall be used and the best available emissions control technology shall be employed. Tier 4 engines shall be used for all construction equipment. If non-road construction equipment that meets Tier 4 engine standards is not available, the Construction Contractor shall be required to use the best available emissions control technologies on all equipment. **MM-AQ-7:** EPA-registered particulate traps and other appropriate controls shall be used where suitable to reduce emissions of DPM and other pollutants at the construction site.	**TSM Alternative:** **CEQA:** No or less than significant impacts **NEPA:** No adverse effects **Alternative 1 and 2:** **CEQA:** Significant impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Significant impact **NEPA:** Adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Operation	Regional criteria pollutant emissions under the TSM Alternative would not exceed SCAQMD significance thresholds.	Regional criteria pollutant emissions under Alternative 1 would exceed the SCAQMD significance threshold for NO_X but would not exceed the significance thresholds for any other pollutant. Although the SCAQMD regional operational emissions threshold for NO_X would be exceeded under Alternative 1, SCAQMD's operational emissions significance thresholds are based on emissions from stationary sources. Because the primary source of operational emissions from this project would be mobile sources (due to changes in auto circulation patterns), the SCAQMD thresholds are provided for informational purposes only. The proposed project's requirement to demonstrate transportation conformity ensures that project emissions are accounted for in the SIP, which demonstrated attainment of the federal ozone standard. As such, ozone precursor emissions of NO_X would be less than significant. Overall operational emissions under Alternative 1 would be less than significant under CEQA and would not be adverse under NEPA. Based on lower intersection approach volumes, idle emissions, and grams/mile emissions relative to the 2003 air quality management plan (AQMP) attainment demonstration, there would be no potential for Alternative 1 carbon monoxide (CO) emissions at any intersection location to result in an exceedance of either the national ambient air quality standards (NAAQS) or California ambient air quality standards (CAAQS) for CO. Alternative 1 would not be considered a project of air quality concern, as defined by 40 Code of Federal Regulations [CFR] 93.123(b) (1). Therefore, it is unlikely that Alternative 1 would generate new air quality violations, worsen existing violations, or delay attainment of NAAQS for $PM_{2.5}$ and PM_{10}. There would be no material change in regional mobile-source air toxic (MSAT)	See discussion for Alternative 1.	Operational impacts for Alternative 3 would be the same as those that would occur for Alternative 1, except that under Alternative 3 both ROG and NOx emissions are anticipated to exceed SCAQMD significance criteria in 2040. All remaining criteria pollutant emissions under Alternative 3 would not exceed SCAQMD significance thresholds. No emissions thresholds would be exceeded in the 2012 scenario. Although the SCAQMD regional operational emissions thresholds would be exceeded in the 2040 Alternative 3 scenario, SCAQMD's operational emissions significance thresholds are based on emissions from stationary sources. Because the primary source of operational emissions from this project would be mobile sources (due to changes in auto circulation patterns), the SCAQMD thresholds are provided for informational purposes only. The proposed project's requirement to demonstrate transportation conformity ensures that project emissions are accounted for in the SIP, which demonstrated attainment of the federal ozone standard. As such, ozone precursor emissions of ROG and NOx would be less than significant. Overall operational emissions under Alternative 3 would be less than significant under CEQA and would not be adverse under NEPA.	Regional criteria pollutant emissions under Alternative 4 would not exceed SCAQMD significance thresholds. Impacts would be less than significant under CEQA and would not be adverse under NEPA.	None required.	**TSM Alternative:** **CEQA:** No or less than significant impact **NEPA:** No adverse effect **Alternative 1 and 2:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
		pollutant emissions under Alternative 1 when compared to the No-Build Alternative.					
Cumulative	Given the TSM Alternative would result in no or negligible increases in pollutant emissions, it would not appreciably contribute to any cumulative air quality impacts.	As the proposed project is listed, as currently proposed, in the region's currently conforming SCAG 2016–2040 RTP/SCS under Project ID 1TR0706 (for the BRT Alternatives) and ID S1160326 (for all build alternatives). The proposed project has been incorporated into amendment 17-02 to the SCAG 2017 FTIP (under project ID LA0G1301). It can be concluded that project emissions would not be cumulatively considerable.	See discussion for Build Alternative 1.	See discussion for Alternative 1	See discussion for Alternative 1	**TSM Alternative:** None required. **Alternatives 1 through 4:** See MM-AQ-1 through MM-AQ-7, listed a couple of rows above.	**TSM, Alternatives 1 through 4:** **CEQA:** No impact **NEPA:** No adverse effect
Climate Change							
Construction	The TSM Alternative may include minor physical improvements to bus stops and roadways; consequently, there would be no or very minor construction-related greenhouse gas (GHG) emissions.	Construction activities under Alternative 1 would involve roadway and sidewalk modifications as well as the installation of canopies at stops, which could result in the emission of approximately 1,280 metric tons of carbon dioxide equivalent (CO_{2e}) over the course of the construction period, or 43 metric tons per year amortized over a 30-year period.	Construction activities under Alternative 2 would involve roadway, bus stop, and sidewalk modifications to allow for a median-running BRT service. These activities could result in the emission of 2,168 metric tons of CO_{2e} over the course of the construction period, or approximately 72 metric tons per year amortized over a 30-year period.	Construction activities under Alternative 3 would involve roadway and sidewalk modifications to allow for median-running Low-Floor LRT/Tram service. In addition, Alternative 3 would involve construction of the MSF, a pedestrian bridge to the Sylmar/San Fernando Metrolink station, and the installation of approximately ten TPSS units. Construction of these facilities could result in the emission of 4,025 metric tons of CO_{2e} over the course of the construction period, or approximately 134 metric tons per year amortized over a 30-year period.	Alternative 4 would involve construction activities and changes to roadways and sidewalks to accommodate LRT service. This would include the construction of a tunnel and three subterranean stations. In addition, Alternative 4 would involve construction of the MSF, a pedestrian bridge to the Sylmar/San Fernando Metrolink station, and the installation of approximately 10 TPSS units. Construction of these facilities could result in the emission of approximately 19,900 metric tons of CO_{2e} over the course of the construction period, or approximately 633 metric tons per year amortized over a 30-year period.	**TSM, Alternatives 1 through 4:** None required.	Since impact determinations take into account the combined effect of construction and operational GHG emissions, please see the impact determinations below for Operation.
Operation	The TSM Alternative would result in a negligible increase in GHG emissions compared with the baseline due to increased bus service and lower operational efficiency of roadways in the project vicinity. It would not conflict with the Assembly Bill (AB) 32, Senate Bill (SB) 375, and Metro and city of Los Angeles goals to reduce GHG emissions by providing the transportation infrastructure necessary to enable more sustainable communities	Alternative 1 would result in in the annual emission of approximately 2,800 metric tons (MT) of CO_{2e} above future (2040) baseline vehicle emissions, an increase of 0.005%. The increased emissions are due to increased bus service and lower operational efficiency of roadways in the project vicinity. Overall, by providing transportation infrastructure necessary to enable more sustainable communities. Alternative 1 would not conflict with the AB 32, SB 32, SB 375, and Metro and city of Los Angeles goals to reduce GHG emissions.	Alternative 2 would result in the annual emission of approximately 165 MT of CO_{2e} above future (2040) baseline vehicle emissions. Also, see the discussion for Alternative 1.	Alternative 3 would result in in the annual emission of approximately 44,000 MT of CO_{2e} above future (2040) baseline vehicle emissions, an increase of 0.072%. Also, see the discussion for Alternative 1. Because of amortized construction emissions as well as ongoing transit-vehicle propulsion and maintenance facility emissions, Alternative 3, in the 2012 scenario, would result in a 0.019% increase in emissions compared with the 2012 baseline scenario.	Alternative 4 would result in the annual emission of approximately 29,000 MT of CO_{2e} below future (2040) baseline vehicle emissions, a decrease of 0.05%.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternatives 1 through 3:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternative 4:** **CEQA:** Beneficial impact **NEPA:** Beneficial effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Cumulative	GHG emissions and climate change are exclusively cumulative impacts; there are no non-cumulative GHG emissions impacts from a climate change perspective. The project would not exceed the threshold of significance and would be consistent with adopted plans and regulations that aim to reduce GHG emissions. Therefore, the project would not contribute to a cumulatively significant impact related to GHG emissions and climate change.	See Cumulative Impacts discussion for the TSM Alternative.	See Cumulative Impacts discussion for the TSM Alternative.	See Cumulative Impacts discussion for the TSM Alternative.	See Cumulative Impacts discussion for the TSM Alternative.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternatives 1 through 3:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternative 4:** **CEQA:** Beneficial impact **NEPA:** Beneficial effect
Noise and Vibration							
Construction	Because proposed physical improvements would only require light construction equipment and any construction would be of very short duration, only non-adverse construction noise or vibration impacts under NEPA and less-than-significant impacts under CEQA are expected to occur for the TSM Alternative.	**Noise:** The construction of the Curb-Running BRT Alternative would require the use of heavy earthmoving equipment, pneumatic tools, generators, concrete pumps, and similar equipment. The predicted noise level from a typical 8-hour work-shift is 86 dBA (8-hour L_{eq}) at 50 feet, which is about 15 to 20 decibels higher than the ambient noise level. The NEPA and CEQA significance threshold is construction noise levels exceeding existing ambient noise levels by 10 dBA or more at a sensitive land use. Therefore, the Curb-Running BRT Alternative could result in significant adverse construction noise impacts/effects under CEQA and NEPA. **Vibration:** The construction of the Curb-Running BRT Alternative would require the use of heavy earthmoving equipment, pneumatic tools, generators, concrete pumps, and similar equipment. Many construction activities, such as pavement breaking, and the use of tracked vehicles, such as bulldozers, could result in noticeable levels of ground-borne vibration. The predicted vibration levels for equipment that produces the highest levels of vibration, such as a vibratory roller, are about equal to the construction vibration significance threshold for non-engineered and timber masonry buildings at a distance of 25 feet.	See discussion for Build Alternative 1	The Low-Floor LRT/Tram Alternative, as well as the LRT Alternative, would result in more extensive construction than the two BRT alternatives.	**Noise:** Impacts resulting from the construction of Alternative 4 would be the same as those that would occur under Alternative 3, with the exception being that Alternative 4 includes tunneling, which is not included in Alternative 3. Noise impacts from tunnel boring machines are expected to be less-than-significant, because operations take place under ground. **Vibration:** Ground-borne noise and vibration impacts associated with tunneling are likely to be less than significant because tunneling will only take place within the ROW. However, an assessment of tunneling operations should be including in the Construction Vibration Control Plan because ground-borne noise and vibration levels from tunneling are highly dependent on the means and methods selected by the contractor.	**TSM Alternative:** None required **Alternatives 1 through 4** **MM-NOI-1a:** Specific measures to be employed to mitigate construction noise impacts shall be developed by the contractor and presented in the form of a Noise Control Plan. The Noise Control Plan shall be submitted for review and approval before the beginning of construction noise activities**MM-NOI-1b**: The contractor shall adequately notify the public of construction operations and schedules no less than 72-hours in advance of construction through a construction notice with confirmed details and a look ahead briefing several weeks in advance. **MM-NOI-1c**: If a noise variance from Section 41.40(a) of the Los Angeles Municipal Code is sought for nighttime construction work, a noise limit shall be specified. The contractor shall employ a combination of the noise-reducing approaches listed in MM-NOI-1d to meet the noise limit. **MM-NOI-1d**: Where feasible, the contractor shall use the following noise-reducing approaches: • The contractor shall use specialty equipment with enclosed engines and/or high-performance mufflers. • The contractor shall locate equipment and staging areas as far from noise-sensitive receivers as possible. • The contractor shall limit unnecessary idling of equipment. • The contractor shall install temporary noise barriers to enclose stationary noise sources, such as compressors, generators, laydown and staging areas, and other noisy equipment.	Noise **TSM Alternative:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 1 through 4** **CEQA:** Less than significant impact **NEPA:** No adverse effect Vibration **TSM Alternative:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						• The contractor shall reroute construction-related truck traffic away from residential buildings to the extent practicable. • The contractor shall sequence the use of equipment so that simultaneous use of the loudest pieces of equipment is avoided as much as practicable. • The contractor shall avoid the use of impact equipment and, where practicable, use non-impact equipment. Non-impact equipment could include electric or hydraulic-powered equipment rather than diesel and gasoline-powered equipment where feasible. • The contractor shall use portable noise control enclosures for welding in the construction staging area. **MM-VIB-1:** Where equipment, such as a vibratory roller, that produces high levels of vibration is used near buildings, the Construction Vibration Control Plan shall include mitigation measures to minimize vibration impact during construction. Recommended construction vibration mitigation measures that shall be considered and implemented where feasible include: • The contractor shall minimize the use of tracked vehicles. • The contractor shall avoid vibratory compaction. • The contractor shall monitor vibration levels near sensitive receivers during activities that generate high vibration levels to ensure thresholds are not exceeded. **Alternatives 3 and 4** Mitigation Measure NOI-1a-d and VIB-1 are proposed.	
Operation	**Noise:** The changes in noise levels as a result of the TSM Alternative would not exceed noise significance thresholds at any sensitive receiver clusters. **Vibration:** Vibration from additional bus volumes or minor changes to the roadway network that would be part of the TSM Alternative would not exceed vibration significance thresholds at any sensitive receivers.	**Noise:** The increase over existing noise levels as a result of the project would be no more than one decibel. **Vibration:** Vibration from the Curb-Running BRT Alternative would not exceed the NEPA or CEQA significance thresholds at any sensitive receivers.	See discussion for Build Alternative 1.	**Noise:** Changes in noise levels would occur as a result of the introduction of Low-Floor LRT/Tram vehicles and removal of all existing buses from Van Nuys Boulevard in the project area. The predicted noise levels would exceed the NEPA and CEQA significance thresholds at three clusters of residences where the alignment would curve to transition between Van Nuys Boulevard and San Fernando Road, as well as where it would be directly adjacent (within 30 feet) of a multi-family residential building and a motel on San Fernando Road just north of Hubbard Avenue.	See discussion for Alternative 3.	**TSM, Alternatives 1 and 2:** None required **Alternative 3 and 4** **MM-NOI-2a:** A sound wall where the row of buildings would be removed shall be constructed to mitigate the increase in traffic noise levels that would result from removing the row of buildings. Sound walls should be constructed in such a fashion as to not impair the Train Operator vision triangle-sightlines. **MM-NOI-2b:** Friction control shall be incorporated into the design for the curve at Van Nuys Boulevard and San Fernando Road. Friction control may consist of installing lubricators on the rail or using an onboard lubrication system that applies lubrication directly to the wheel.	Noise **TSM Alternative:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 1 through 4** **CEQA:** Less than significant impact **NEPA:** No adverse effect Vibration **TSM, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4 :** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
				Vibration: The predicted vibration levels would exceed the NEPA and CEQA significance threshold at 17 clusters of sensitive residential receivers and one institutional land use. The TPSS units and MSF Options have the potential to cause noise impacts.		The recommended measure for the third cluster where predicted noise levels exceed the NEPA and CEQA significance thresholds is to specify and procure low-noise vehicles (see MM-NOI-2c below). Low-noise vehicles would reduce the predicted noise level by 2 to 3 decibels at all receivers. A sound wall would not be a feasible mitigation measure because there is a narrow right-of-way making it difficult to accommodate a sound wall and because a sound wall might create a visual impact. If specifying a low-noise vehicle is not a feasible mitigation measure, building sound insulation shall be considered as an alternative. Improving building sound insulation increases the outdoor-to-indoor noise reduction and is often the best choice where sound walls are not feasible or reasonable. Specifying a low-noise vehicle is the preferred mitigation measure because it would reduce noise levels in exterior areas of the impacted receivers and it would have the benefit of reducing noise levels at all receivers throughout the project area. **MM-NOI-2c:** Metro shall specify and procure low-noise vehicles with a reference sound level of 75 dBA maximum sound level (L_{max}) at 50 feet and 50 miles per hour (mph) for a 2-car train on ballast-and-tie track. Manufacturers could meet this level using a combination of vehicle skirts, a well-designed suspension, and under-car absorption. If specifying a low-noise vehicle is not feasible, Metro shall improve building insulation at the noise-sensitive uses significantly affected by transit vehicle noise. If sound insulation is used, the sound insulation should reduce project noise to below 45 dBA L_{dn} inside the residence. Noise impacts are also predicted near five of the proposed TPSS sites. The measures that are proposed to mitigate noise from the TPSS units are: **MM-NOI-3a**: The following noise limit shall be included in the purchase specifications for the TPSS units: TPSS noise shall not exceed 50 dBA at a distance of 50 feet from any part of a TPSS unit. **MM-NOI-3b**: The TPSS units shall be located within the parcel as far from sensitive receivers as feasible. If possible, the cooling fans shall be oriented away from sensitive receivers.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						MM-NOI-3c: If necessary, a sound enclosure shall be built around the TPSS unit to further reduce noise levels at sensitive receivers to below the applicable impact threshold. Noise impacts are predicted at sensitive receivers near MSF Option A and C. Proposed measures to mitigate MSF noise include: **MM-NOI-4a:** Low-impact frogs shall be used at crossovers, where feasible. Monoblock or welded boltless manganese (WBM) frogs are low-impact frogs that may be appropriate for heavy use at a maintenance facility. Where low-impact frogs are not feasible, a noise study shall be completed when the MSF layout is finalized to determine where sound walls are necessary to mitigate noise levels. **MM-NOI-4b:** The MSF facility shall be laid out with the noisiest operations located away from sensitive receivers wherever possible. For example, the open façade of the carwash facility shall not directly face sensitive receivers if feasible. When the layout of the MSF facility is finalized, a noise assessment shall be completed to determine if sound walls are necessary to mitigate noise levels. Predicted vibration levels could be reduced to below the NEPA and CEQA significance thresholds at all sensitive receivers with traditional floating slab track. A floating slab consists of a concrete slab supported by rubber or steel springs. Floating slab is the most expensive vibration mitigation measure; however, it provides the most reduction in vibration levels. Further investigation may show that vibration levels could be reduced to below the applicable thresholds with a less expensive option, such as a continuous mat floating slab. **MM-VIB-2:** The contractor shall install a floating-slab track where predicted vibration levels would exceed the NEPA and CEQA significance thresholds. Or alternatively, the contractor may install a less expensive option, such as a continuous mat floating slab or a vibration isolated embedded track system such as QTrack, if further investigation confirms that the alternative method would reduce vibration levels below the applicable thresholds.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Cumulative	Given the minimal amount of construction, the TSM Alternative would not contribute to any significant cumulative noise and vibration impacts within the cumulative impacts study area.	Although it is not possible to predict with certainty which future projects would contribute to cumulative noise levels and quantify the increase in noise levels, nonetheless, for the purposes of this EIS/EIR, the short-term and temporary cumulative construction noise impacts due to the Curb-Running BRT Alternative and other noise and vibration sources are considered to be potentially significant. Although the potential increase in noise levels along San Fernando Road due to the Curb-Running BRT Alternative would be negligible, noise generated by this alternative combined with other future sources of noise along San Fernando Road, such as the CAHSR Project, could potentially result in significant cumulative noise impacts.	See discussion for Build Alternative 1	Although recommended construction noise mitigation measures would reduce temporary construction noise impacts due to the proposed project to a less-than significant level, the residual increases in noise levels due to the Low-Floor LRT/Tram Alternative, when combined with increased noise generated by other sources or projects in the vicinity of the study area, could result in cumulatively considerable noise impacts.	See discussion for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 and 2:** MM-NOI-1a through MM-NOI-1d, MM-VIB-1a through MM-VIB-1c listed in the row above **Alternatives 3 and 4:** MM-NOI-1a through MM-NOI-1d, MM-VIB-1a through MM-VIB-1c, MM-NOI-2a through MM-NOI-2c, MM-NOI-3a through MM-NOI-3c, MM-NOI-4a and MM-NOI-4b, MM-VIB-2 listed two rows above	Noise: **TSM Alternative:** **CEQA:** No significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Potentially significant impact **NEPA:** Potentially adverse effect Vibration: **TSM, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4 :** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Geology, Soils and Seismicity							
Construction	Given the very limited amount of construction that could occur under this alternative, geological hazards in the project area are not likely to affect or be affected by construction activities. Therefore, no or very minor impacts/effects would occur during construction.	Potential impacts due to construction of Alternative 1 would be similar to those that would occur as result of a typical construction project and would include the potential for undermining of existing structures and potential geologic/soils hazards to construction workers.	See discussion for Alternative 1.	See discussion for Alternative 1	The LRT Alternative would result in the same construction impacts/hazards similar to the other alternatives, except that under this alternative, the tunneling and deep excavations during construction could cause vertical and lateral movement of the existing soils adjacent to the improvements. The LRT Alternative could also be affected by groundwater hazards during construction due to the depth of excavation.	**TSM:** None required **Alternatives 3 and 4:** See measures MM-GEO-3 and MM-GEO-4 below. **Alternative 4:** See measures MM-GEO-3 through MM-GEO-5 below.	**TSM, Alternatives 1 through 4** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Operation	Given the small size of the bus stop structures and the fact they would be constructed in accordance with current building codes, the potential risks would be minimal. Operation of this alternative would also not cause or accelerate geologic hazards or increase soil instability because the physical improvements would be minor and constructed on flat terrain in a developed urban area.	Structures constructed under the Curb-Running BRT Alternative, which would include new traffic and pedestrian signs and bus stop canopies, could experience strong seismic ground shaking and pose a hazard to riders and passers-by. On the north end of the alternative alignment, the Sylmar/San Fernando Station is located with an Alquist-Priolo Earthquake Fault Zone (APEFZ). Some project components would be subject to faulting. A portion of the alignment south of Vanowen Street would be subject to liquefaction. The alignment is within a dam failure inundation zone, though flooding risk is low.	See discussion for Build Alternative 1	The proposed pedestrian bridge for the Sylmar/San Fernando Station is located within an APEFZ, and the Pacoima Wash Bridge is located in the City of Los Angeles Fault Rupture Study Area. Fault rapture hazards to these project facilities could be significant. Some project structures would be subject to strong seismic ground shaking and could pose a hazard to riders and passers-by. Flooding risks would be the same as those mentioned in Alternative 1.	The operational impacts of the LRT Alternative would be the same as those of the Low-Floor LRT/Tram Alternative, except unlike the Low-Floor Tram/LRT Alternative, this alternative would include a tunnel. Because of the presence of alluvial soils, the tunnel segment of the alignment could be susceptible to seismic-induced settlement and ground loss, a potentially significant hazard.	**TSM, Alternatives 1 and 2:** None required **Alternatives 3 and 4** **MM-GEO-1:** Metro design criteria require probabilistic seismic hazard analyses (PSHA) to estimate earthquake loads on structures. These analyses take into account the combined effects of all nearby faults to estimate ground shaking. During Final Design, site-specific PSHAs shall be used as the basis for evaluating the ground motion levels along the project corridor. The structural elements of the proposed project shall be designed and constructed to resist or accommodate appropriate site-specific estimates of ground loads and distortions imposed by the design	**TSM, Alternatives 1 through 4** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						earthquakes and conform to Metro's *Design Standards for the Operating and Maximum Design Earthquakes*. The concrete structures are designed according to the *Building Code Requirements for Structural Concrete* (ACI 318) by the American Concrete Institute. **MM-GEO-2:** At liquefaction or seismic settlement prone areas, evaluations by geotechnical engineers shall be performed during Final Design to provide estimates of the magnitude of the anticipated liquefaction or settlement. Based on the magnitude of evaluated liquefaction, either structural design, or ground improvement (such as deep soil mixing) or deep foundations to non-liquefiable soil (such as drilled piles) measures shall be selected. Site-specific design shall be selected based on State of California guidelines and design criteria set forth in the *Metro Seismic Design Criteria*. **MM-GEO-3:** In addition to design measures, as Metro has implemented on the existing Red Line, it shall implement standard operating procedures (SOP) in seismic areas to detect earthquakes and shall provide back-up power, lighting, and ventilation systems to increase safety during tunnel or station evacuations in the event of loss of power due to an earthquake. For example, seismographs are located in 11 of the existing Metro Red/Purple Line stations to detect ground motions and trigger SOPs (SOP#8 – Earthquake) by the train operators and controllers. Operating procedures are dependent on the level of earthquake and include stopping or holding trains, gas monitoring, informing passengers, communications with Metro's Central Control, and inspecting for damage. **MM-GEO-4:** As with the existing Red or Purple Lines and the Metro Gold Line Eastside Extension, Metro shall install gas monitoring and detection systems with alarms, as well as ventilation equipment to dissipate gas to safe levels according to Metro's current design criteria and Cal/OSHA standards for a safe work environment. Measures shall include, but are not limited to, the following for both tunnel and station operation: • High volume ventilation systems with back-up power sources • Gas detection systems with alarms • Emergency ventilation triggered by the gas detection systems	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						• Automatic equipment shut-off • Maintenance and operations personnel training • Gas detection instrumentation is set to send alarms to activate ventilation systems and evacuate the structures as follows: methane gas – minor alarm at 10 percent of the lower explosive limit (LEL) (activate ventilation) and major alarms at 20 percent of LEL (evacuation of area) • Hydrogen sulfide – minor alarm at 8 parts per million (ppm) and major alarm at 10 ppm. **MM-GEO-5:** Tunnels and stations shall be designed to provide a redundant protection system against gas intrusion hazard. The primary protection from hazardous gases during operations is provided by the physical barriers (tunnel and station liner membranes) that keep gas out of tunnels and stations. As with the existing Metro Red and Purple Lines and the Metro Gold Line Eastside Extension, tunnels and stations shall be designed to exclude gas to below alarm levels (GEO-4) and include gas monitoring and detection systems with alarms, as well as ventilation equipment to dissipate gas. • At stations in elevated gassy ground(e.g., Van Nuys Metrolink Station and Sherman Way Station), construction shall be accomplished using slurry walls – or similar methods such as continuous drilled piles – to provide a reduction of gas inflow both during and after construction than would occur with conventional soldier piles and lagging. • Other station design concepts to reduce gas and water leakage are the use of additional barriers; compartmentalized barriers to facilitate leak sealing; and flexible sealants, such as poly-rubber gels, along with high-density polyethylene-type materials used on Metro's underground stations. • Consideration of secondary station walls to provide additional barriers or an active system (low or high pressure barrier) shall also be studied during Final Design to further to determine if they will be incorporated into the Final design of the tunnel and stations. • The evaluations for station and tunnel construction materials shall include laboratory testing programs such as those conducted for the Metro Gold Line Eastside Extension during development of	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						the double gasket system and material testing for long-term exposure to the ground conditions for materials such as rubber gaskets used for tunnel segment linings. Testing programs shall examine: o Segment leakage – gasket seal under pressure before, during, and after seismic movements. This will include various gasket materials and profiles (height and width). o Gasket material properties – effective life and resistance to deterioration when subjected to man-made and natural contaminants, including methane, asphaltic materials, and hydrogen sulfide. o Alternative products to high-density polyethylene products such as poly-rubber gels, now in use in ground containing methane in other cities. Methods for field testing high-density polyethylene joints. These are now being used for landfill liners and water tunnels under internal water pressure.	
Cumulative	Cumulative impacts could occur when subsurface excavations result in ground and differential settlement that could affect adjacent properties. If other nearby projects would also include excavation activities that could result in the potential settlement of soils, then the proposed and nearby projects could result in adverse cumulative settlement impacts on nearby properties. However, given the limited amount of construction that is anticipated to occur under the TSM Alternative, it's unlikely this alternative would result in cumulative ground and differential settlement impacts.	Although more extensive construction would occur under Alternative 1 than under the TSM Alternative, the amount of excavation and potential for settlement would be minimal; therefore, it is unlikely this alternative would contribute to significant cumulative settlement impacts.	See discussion for TSM and Alternative 1	See discussion for TSM and Alternative 1	The LRT Alternative, unlike the other alternatives, could result in substantial settlement impacts. The study area for cumulative geological hazards due to the LRT Alternative is limited to those properties adjacent to the tunnel portion of the LRT alignment. Although the project and cumulative impacts could be significant, compliance with proposed design and mitigation measures would reduce potential impacts to a less-than-significant level.	**TSM, Alternatives 1 and 2:** None required **Alternatives 3 and 4:** MM-GEO-1 through MM-GEO-5 listed in the row above	**CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Hazardous Waste and Materials							
Construction	Construction would be very minor and would be generally limited to minor roadway modifications and bus stop amenities/improvements. It is unlikely that significant amounts of materials, soils, or groundwater containing hazardous materials or wastes would be encountered during construction.	Construction may encounter hazardous materials during grading and excavation, though work would generally be limited to within the upper 5 feet of soil. It is likely that lead and arsenic may have been deposited within the soil along the project alignment and could occur at hazardous levels. Yellow thermoplastic paint markings on the pavement to be removed may contain lead and other heavy metals such as chromium. Dust created from construction activities may contain hazardous contaminants. Construction equipment contains fuel, hydraulic oil, lubricants, and other hazardous materials, which could be released accidentally.	The Median-Running BRT Alternative would result in the same construction impacts as the Curb-Running BRT Alternative.	Deeper construction excavations for the retrofit or replacement of structures crossing the Pacoima Wash or the foundations for the new pedestrian crossing at the San Fernando Metrolink Station could result in the potential for encountering groundwater contaminated by volatile organic compounds (VOCs). Lead-based paint (LBP) and asbestos containing material (ACM) may be encountered in waste building materials during demolition of existing structures for the MSF and TPSSs facilities.	Construction for at-grade portions of the project would result in the same impacts as Alternative 3. The cut and cover/tunneling portion of this alternative would consist of excavations as deep as 80 feet, with piles extending deeper. The tunnel would cross beneath former and current manufacturing and industrial sites that may contain soils containing hydrocarbons, VOCs, and other hazardous waste constituents. The southern end of the proposed tunnel would potentially be located below historically high groundwater levels, which may be contaminated with hazardous materials.	**TSM Alternative:** None required **Alternatives 1 through 4:** **MM-HAZ-1 (All Build Alternatives)**: An environmental investigation shall be performed during design for above-grade or below-grade transit structures, stations, and the maintenance yard. The environmental investigation shall collect soil, groundwater, and/or soil gas samples to delineate potential areas of contamination that may be encountered during construction or operations. The environmental investigation shall include the following: • Properties potentially to be acquired are listed on multiple databases and shall be evaluated further for contaminants that were manufactured, stored, or released from the facility. If contaminated soil is found, it shall be removed, transported to an approved disposal location, and remediated according to state law. • Phase II subsurface investigations for potential impacts from adjoining current or former underground storage tank (UST) sites and nearby leaking underground storage tank (LUST) sites may be recommended pending the selection of the preferred alternative, potential ROW acquisitions, the depth of excavation, and the result of a review of archives on file with the City of Los Angeles Fire Department (LAFD) and Regional Water Quality Control Board (RWQCB). • A Phase II subsurface investigation to evaluate potential presence of perchloroethylene (PCE) shall be performed along the portions of the project alignment that are adjacent to former and current dry cleaners. If contaminated soil is found, it shall be removed, transported to an approved disposal location, and remediated according to state law. • If construction encroaches into the two former plugged and abandoned dry-hole oil exploration wells mapped adjacent to the proposed project ROW, the project team shall consult with the Division of Oil, Gas and Geothermal Resources (DOGGR) regarding the exact locations of the abandoned holes and the potential impact of the wells on proposed construction.	**TSM, Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						• The locations of proposed improvements involving excavations adjacent to (within 50 feet of) the electrical substation shall be screened prior to construction by testing soils within 5 feet of the existing ground surface for polychloroniated biphenyls (PCBs). If contaminated soil is found, it shall be removed, transported to an approved disposal location, and remediated according to state law. • Buildings that will be demolished shall have a comprehensive ACM inspection prior to demolition. In addition, ACM may be present in the existing bridge crossings at the Pacoima Diversion Channels. If improvements associated with the corridor alternative selected for final design will disturb the existing bridge crossings, then these structures shall be evaluated for suspect ACM. If ACM is found, it shall be removed, and transported to an approved disposal location according to state law. • Areas along the project alignment where soil may be disturbed during construction shall be tested for aerially deposited lead (ADL) according to Caltrans ADL testing guidelines. If contaminated soil is found, it shall be removed, transported to an approved disposal location, and remediated according to state law. • Lead and other heavy metals, such as chromium, may be present within yellow thermoplastic paint markings on the pavement. These surfacing materials shall be tested for LBP prior to removal. If contaminated soil is found, it shall be removed, transported to an approved disposal location, and remediated according to state law. • Former railroad ROWs that crossed or were adjacent to the project ROW may contain hazardous materials from the use of weed control, including herbicides and arsenic, and may also contain Treated Wood Waste (TWW). Soil sampling for potentially hazardous weed control substances shall be conducted for health and safety concerns in the event that construction earthwork involves soil removal from the former railroad ROWs. If encountered during construction, railroad ties designated for reuse or disposal (including previously salvaged railroad ties in the project ROW) shall be managed or disposed of as TWW in accordance with Alternative Management Standards provided in CCR Title 22 Section 67386.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						MM-HAZ-2 (All Build Alternatives): The contractor shall implement a Worker Health and Safety Plan prior to the start of construction activities. All workers shall be required to review the plan, receive training if necessary, and sign the plan prior to starting work. The plan shall identify properties of concern, the nature and extent of contaminants that could be encountered during excavation activities, appropriate health and environmental protection procedures and equipment, emergency response procedures including the most direct route to a hospital, and contact information for the Site Safety Officer. **MM-HAZ-3(All Build Alternatives):** The contractor shall implement a Contaminated Soil/Groundwater Management Plan during construction to establish procedures to follow if contamination is encountered in order to minimize associated risks. The plan shall be prepared during the final design phase of the project, and the construction contractor shall be held to the level of performance specified in the plan. The plan shall include procedures for the implementation of the following measures: • Contacting appropriate regulatory agencies if contaminated soil or groundwater is encountered • Sampling and analysis of soil and/or groundwater known or suspected to be impacted by hazardous materials • Legal and proper handling, storage, treatment, transport, and disposal of contaminated soil and/or groundwater shall be delineated and conducted in consultation with regulatory agencies, in accordance with established statutory and regulatory requirements in Section 4.10.1.1 of this EIS/EIR • Implementation of dust control measures such as soil wetting, wind screens, etc., for contaminated soil • Groundwater collection, treatment, and discharge shall be performed according to applicable standards and procedures listed in Section 4.10.1.1 of this EIS/EIR **MM-HAZ-4 (All Build Alternatives):** The contractor shall properly maintain equipment and properly store and manage related hazardous materials, so as to prevent motor oil, or other potentially hazardous substances used during construction, from spilling onto the soil. If contaminated soil is found, it shall be removed, transported to an approved disposal location, and remediated according to state law.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						Alternative 4: MM-HAZ-1 through MM-HAZ 4 and the following proposed measure: **MM-HAZ-5:** In addition to the environmental studies identified above in MM-HAZ-1, the environmental investigation for the LRT Alternative shall include the following: • If reconstruction of the Pacoima Wash bridge on San Fernando Road is proposed, the construction spoils (e.g., excavated soils, cuttings generated during installation of cast in drilled hole piles (CIDH piles), including those in contact with the groundwater, shall be contained and tested for total chromium, 1,4-dioxane, trichloroethylene (TCE), and PCE to determine appropriate disposal. • Phase II subsurface investigation shall be performed along the below-grade segment of the corridor to evaluate the need for environmental remediation measures during construction. The Phase II site investigation shall include the installation of groundwater monitoring wells for the tunneling portion of the alternative. • An existing underground injection control well is located adjacent to the proposed tunnel along Van Nuys Boulevard for the LRT corridor alternative. The design team shall consult with California Department of Conservation to evaluate the potential impact of the well on the proposed improvements that could encounter groundwater and are located within ⅛ mile of the well. • To evaluate for the presence of deeper soil contamination and VOCs in groundwater at cut and cover/tunnel excavation locations, soil borings shall be performed and groundwater monitoring wells shall be installed. Soil sampling shall include environmental screening for contamination by visual observations and field screening for VOCs with a photoionization detector (PID). Based on field screening, soil samples shall be analyzed for the suspected chemicals by a certified laboratory. Groundwater samples shall be analyzed for VOCs. • A Contaminated Soil/Groundwater Management Plan shall be prepared during final design that describes appropriate methods and measures to manage contamination encountered during construction.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Operation	Increased bus service could increase use of hazardous materials required to operate and maintain the bus fleet. Mechanical failure or accidents could increase release of lubricants contained in bus vehicles.	Alternative 1 would result in the same impacts as those described for the TSM Alternative. To the extent that this alternative increases bus vehicle service miles beyond what would occur under the TSM Alternative, it would result in a proportionally greater potential for operational hazardous materials impacts.	The Median-Running BRT Alternative would result in the same construction impacts as the Curb-Running BRT Alternative.	The MSF will use and store hazardous materials including fuels, lubricants, and paints, for maintenance of the rail vehicles. The Low-Floor LRT/Tram vehicles would be electrically powered and would not contain fuels that could be released to the environment in the event of an accident or mechanical failure.	This alternative would result in the same impacts as those that would occur under Alternative 3. However, the tunnel and below grade stations have the potential for vapor intrusion from soil and groundwater contamination.	**TSM, Alternatives 1 through 3:** None required **Alternative 4:** **MM-HAZ-6:** Engineering controls shall be implemented to increase ventilation in the below-grade structures, if vapor intrusion from soil and groundwater contamination is above regulatory levels.	**TSM, Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Cumulative	Given the low potential for encountering hazardous materials and the fact that compliance with regulatory requirements would minimize any potential impacts that could occur due to the TSM Alternative and related projects, it is not expected that the TSM Alternative would contribute to any significant cumulative hazardous waste and materials impacts.	Construction of other related projects could encounter soils or groundwater contaminated by current or historical uses. Disturbance of contaminated soils or groundwater could expose workers, the public, and environment to increased hazards and result in cumulative hazardous materials impacts.	See discussion for Alternative 1.	See discussion for Alternative 1.	See discussion for Alternative 1.	**TSM Alternative:** None required **Alternatives 1 through 3:** MM-HAZ-1 through MM-HAZ-4 listed above **Alternative 4:** MM-HAZ-1 through MM-HAZ-6 listed above	**TSM, Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Energy							
Construction	Construction would require minimal amounts of energy and construction activities would comply with the Metro Green Construction Policy. No buildings subject to energy standards required by Title 24 of the California Code of Regulations would be constructed under the TSM Alternative.	Alternative 1 would not result in the wasteful or inefficient use of energy. Most of the energy would be in the form of diesel fuel used by construction equipment and vehicles and would not require new or expanded sources of energy or infrastructure to meet demands (17,618 MMBTU [million British thermal units]).	See discussion for Alternative 1. However, note that Alternative 2 would have slightly higher energy demands (29,816 MMBTU).	Construction of an MSF, new at-grade stations, a pedestrian bridge to the Sylmar Metrolink station, modifications to sidewalks and roadways, and the installation of TPSS units are required under Alternative 3. Impacts are the same as those of Alternative 1, but with higher energy demands (55,366 MMBTU).	Alternative 4 would involve the construction of a LRT system, an underground segment, an MSF, new stations, a pedestrian bridge to the Sylmar Metrolink station, modifications to sidewalks and roadways, and the installation of TPSS units. MSF Option A was assumed when estimating energy consumption, as it would be the most energy-intensive method. Impacts would be the same as those of Alternative 1, but with higher energy demands (273,600 MMBTU).	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Operation	Direct impacts could include electricity consumption and fuel consumption. Indirect impacts would occur as a result of the impacts on traffic. However, this alternative would not result in the wasteful, inefficient, or unnecessary use of energy or require new energy infrastructure.	This alternative would not result in the wasteful, inefficient, or unnecessary consumption of energy and no new energy infrastructure that would result in significant impacts on the environment would be required.	See discussion for Alternative 1.	Overall operational energy consumption under Alternative 3 would increase relative to future (2040) baseline conditions, but it would not result in the wasteful, inefficient, or unnecessary consumption of energy.	The decrease in total energy use would be consistent with long-term conservation goals. Additionally, energy would not be consumed in a wasteful, inefficient, or unnecessary manner. Operation of Alternative 4 would decrease overall energy use relative to future (2040) baseline conditions,	**TSM, Alternatives 1 through 4:** None required.	**TSM Alternative:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Cumulative Impacts	With the exception of instances in which projects require the physical development of new power generation, transmission, or fueling facilities, energy use impacts are cumulative impacts in that all energy consumed comes from a common resource pool. Where energy providers have identified	See cumulative impacts discussion for the TSM Alternative.	See cumulative impacts discussion for the TSM Alternative.	See cumulative impacts discussion for the TSM Alternative.	See cumulative impacts discussion for the TSM Alternative.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
	specific individual projects that are required to meet future projected regional cumulative demands and determined that construction or operation of those projects would result in significant impacts to the environment, then the cumulative impact of the proposed project and the energy infrastructure projects would be considered significant. However, where the extent and details of future infrastructure improvements and their impacts have not been identified, the significance of potential cumulative impacts cannot be definitively determined and it would be speculative[1] to assume the cumulative impacts would be significant.						
Ecosystems/Biological Resources							
Construction	The TSM Alternative proposes transportation systems upgrades, which may include relatively low-cost transit service improvements and minor physical improvements that would be limited to the public roadway right-of-way. As a consequence, no or very minor impacts to biological resources would occur.	**Special-Status Plants and Animals:** There is a potential for pallid bat, western yellow bat, and big free-tailed bat to occur in the study area. These species could be significantly affected by removal of adjacent vegetation. Ornamental landscaping and bus stop canopies with nesting birds exist within the study area. **Conflict with Local Polices:** Construction of new bus stop canopies could require the removal of trees protected by the City of LA and/or San Fernando tree ordinances. Removal of protected trees would conflict with the city ordinances, which would be a significant impact under CEQA and adverse effect under NEPA. If protected trees are to be removed, implementation of Mitigation Measure BIO-4 would be required to ensure compliance with city ordinances. The biological consequence of removing or trimming urban trees would be less than significant under CEQA and a no adverse effect under NEPA with implementation of Mitigation Measure BIO-4.	See discussion under Build Alternative 1.	Alternative 3 could result in potentially significant impacts/adverse effects to nesting birds or roosting bats if construction activities remove vegetation where nesting birds are present or affect structures or vegetation used by special-status bat species.	Alternative 4 could result in potentially significant impacts/ adverse effects to nesting birds or roosting bats if construction activities remove vegetation where nesting birds are present or affect structures or vegetation used by special-status bat species.	**TSM Alternative:** None required. **Alternatives 1 through 4:** **MM-BIO-1: Avoid and Minimize Project-Related Impact on Special-Status Bat Species** In the maternity season (April 15 through August 31) prior to the commencement of construction activities, a field survey shall be conducted by a qualified biologist to determine the potential presence of colonial bat roosts (including palm trees) on or within 100 feet of the project boundaries. Should a potential roost be identified that will be affected by proposed construction activities, a visual inspection and/or one-night emergence survey shall be used to determine if it is being used as a maternity-roost. To avoid any impacts on roosting bats resulting from construction activities, the following measures shall be implemented: Bridges and Overpasses • Should potential bat roosts be identified that will require removal, humane exclusionary devices shall be used. Instillation would occur outside of the maternity season and hibernation period (February 16-April 14 and August 16-October 30, or as determined by a qualified biologist) unless it has been confirmed as	**TSM Alternative:** **CEQA:** No or minor impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

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	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						absent of bats. If the roost has been determined to have been used by bats, the creation of alternate roost habitat shall be required, with CDFW consultation. The roost shall not be removed until it has been confirmed by a qualified biologist that all bats have been successfully excluded. • Should an active maternity roost be identified, a determination (in consultation with CDFW or a qualified bat expert) shall be made whether indirect effects of construction-related activities (i.e., noise and vibration) could substantially disturb roosting bats. This determination shall be based on baseline noise/vibrations levels, anticipated noise-levels associated with construction of the proposed project, and the sensitivity to noise-disturbances of the bat species present. If it is determined that noise could result in the temporary abandonment of a day-roost, construction-related activities shall be scheduled to avoid the maternity season (April 15 through August 31), or as determined by the biologist. Trees All trees to be removed as part of the project shall be evaluated for their potential to support bat roosts. The following measures would apply to trees to be removed that are determined to provide potential bat roost habitat by a qualified biologist. • If trees with colonial bat roost potential require removal during the maternity season (April 15 through August 31), a qualified bat biologist shall conduct a one-night emergence survey during acceptable weather conditions (no rain or high winds, night temperatures above 52°F) or if conditions permit, physically examine the roost for presence or absence of bats (such as with lift equipment) before the start of construction/removal. If the roost is determined to be occupied during this time, the tree shall be avoided until after the maternity season when young are self-sufficiently volant. • If trees with potential colonial bat roost potential require removal during the winter months when bats are in torpor, a state in which the bats have significantly lowered their physiological state, such as body temperature and metabolic rate, due to lowered food availability. (October 31 through February 15, but is dependent on specific weather conditions), a qualified bat biologist shall physically examine the roost if conditions permit for presence or absence of bats (such as with lift	

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						equipment) before the start of construction. If the roost is determined to be occupied during this time, the tree shall be avoided until after the winter season when bats are once again active. • Trees with potential colonial bat habitat can be removed outside of the maternity season and winter season (February 16 through April 14 and August 16 through October 30, or as determined by a qualified biologist) using a two-step tree trimming process that occurs over 2 consecutive days. On Day 1, under the supervision of a qualified bat biologist, Step 1 shall include branches and limbs with no cavities removed by hand (e.g., using chainsaws). This will create a disturbance (noise and vibration) and physically alter the tree. Bats roosting in the tree will either abandon the roost immediately (rarely) or, after emergence, will avoid returning to the roost. On Day 2, Step 2 of the tree removal may occur, which would be removal of the remainder of the tree. Trees that are only to be trimmed and not removed would be processed in the same manner; if a branch with a potential roost must be removed, all surrounding branches would be trimmed on Day 1 under supervision of a qualified bat biologist and then the limb with the potential roost would be removed on Day 2. • Trees with foliage (and without colonial bat roost potential), such as sycamores, that can support lasiurine bats, shall have the two-step tree trimming process occur over one day under the supervision of a qualified bat biologist. Step 1 would be to remove adjacent, smaller, or non-habitat trees to create noise and vibration disturbance that would cause abandonment. Step 2 would be to remove the remainder of tree on that same day. For palm trees that can support western yellow bat (the only special-status lasiurine species with the potential to occur in the project area), shall use the two-step tree process over two days. Western yellow bats may move deeper within the dead fronds during disturbance. The two-day process will allow the bats to vacate the tree before removal. **MM BIO-2: Avoid Impacts on Nesting Birds (including raptors)** To avoid any impacts on migratory birds, resulting from construction activities that may occur during the nesting season, March 1 through August 31, the following measure shall be implemented:	

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						• A qualified biologist shall conduct a preconstruction survey of the proposed construction alignment with a 150-foot buffer for passerines and 500-feet for raptors around the site. This preconstruction survey shall commence no more than 3 days prior to the onset of construction, such as clearing and grubbing and initial ground disturbance. • If a nest is observed, an appropriate buffer shall be established, as determined by a qualified biologist, based on the sensitivity of the species. For nesting raptors, the minimum buffer shall be 150 feet. The contractor shall be notified of active nests and directed to avoid any activities within the buffer zone until the nests are no longer considered to be active by the biologist. **MM BIO-3: Jurisdictional Waters** Any work resulting in materials that could be discharged into jurisdictional features shall adhere to strict best management practices (BMPs) to prevent potential pollutants from entering any jurisdictional feature. Applicable BMPs to be applied shall be included in the Stormwater Pollution Prevention Plan and/or Water Quality Management Plan and shall include, but not be limited to, the following BMPs as appropriate: • Containment around the site shall include use of temporary measures such as fiber rolls to surround the construction areas to prevent any spills of slurry discharge or spoils recovered during the separation process; • Downstream drainage inlets shall be temporarily covered to prevent discharge from entering the storm drain system; • Construction entrances/exits shall be properly set up so as to reduce or eliminate the tracking of sediment and debris offsite by including grading to prevent runoff from leaving the site, and establishing “rumble racks” or wheel water points at the exit to remove sediment from construction vehicles; • Onsite rinsing or cleaning of any equipment shall be performed in contained areas and rinse water shall be collected for appropriate disposal; • Use of a tank on work sites to collect the water for periodic offsite disposal; • Soil and other building materials (e.g., gravel) stored onsite shall be contained and covered to prevent contact with stormwater and offsite discharge; and	

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						• Water quality of runoff shall be periodically monitored before discharge from the site and into the storm drainage system. **MM BIO-4: A Project Tree Report Shall Be Approved by the City of Los Angeles and City of San Fernando** Prior to construction, the contractor shall review the approved alternative alignment to determine whether any trees protected by the City of Los Angeles Tree Ordinance 177404 and City of San Fernando Comprehensive Tree Management Program Ordinance (Ordinance No. 1539) will be removed or trimmed. A tree report must be prepared, by a qualified arborist, for the project and approved by each city. Trees approved for removal (or replacement) shall be done in accordance to the specifications outlined in the city ordinances.	
Operation	The TSM Alternative emphasizes transportation systems upgrades, which may include relatively low-cost transit service improvements, such as increased bus frequencies. Because the buses would operate along existing roadways in a developed urban area, no adverse operational impacts or effects on ecosystems/biological resources are expected to occur.	The project is planned within an existing urban neighborhood and regional commercial setting, and wildlife species in the area are urban-tolerant. Operation of this alternative would result in no impact/no effect on biological resources in the study area.	See discussion for Alternative 1.	Installation of the overhead catenary system lines for the LRT Alternative would potentially have an impact on avian species by increasing line collisions and electrocution risks. However, the project is planned within an existing urban area, and wildlife species in the area are urban-tolerant.	See discussion for Alternative 3.	**TSM, Alternatives 1 through 4:** None required.	**TSM Alternative:** **CEQA:** No or less-than-significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Cumulative	The TSM Alternative would result in no or very minor construction impacts/effects and no operational impacts or effects. As a consequence, it would not contribute to any significant cumulative impacts.	Any biological resources impacts due to the build alternatives would be mitigated with implementation of proposed mitigation measures. The related projects are also expected to result in no or minimal impacts on biological resources for similar reasons. Implementation of the build alternatives would not result in or contribute to significant cumulative impacts on regional flora and fauna.	See discussion for Build Alternative 1.	See discussion for Build Alternative 1.	See discussion for Build Alternative 1.	**TSM, Alternatives 1 through 4:** None required. See mitigation measures BIO-1 through BIO-4 in the construction discussion two rows above.	**TSM Alternative:** **CEQA:** No or less-than-significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

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	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Water Resources/Hydrology and Water Quality							
Construction	Any construction activities required under the TSM Alternative would be minimal (e.g., construction of bus stop amenities, signage, and minor roadway improvements); therefore, no or very minor construction impacts/effects would occur.	**Water Quality:** Construction of Alternative 1 could include reconstruction of sidewalks, paving, and striping, which could result in an increase in surface water pollutants such as sediment, oil and grease, and miscellaneous wastes. Increased turbidity and other pollutants resulting from construction-related discharges can ultimately introduce compounds toxic to aquatic organisms, increase water temperature, and stimulate the growth of algae. Delivery, handling, and storage could increase the risk of stormwater contamination. A stormwater pollution prevention plan (SWPPP) would be prepared to minimize contact of construction materials, equipment, and maintenance supplies with stormwater. **Stormwater and Drainage:** Use of groundwater would be minimal and temporary. Construction activities could result in increased erosion. Temporary drainage facilities could be required to redirect runoff from work areas.	See discussion for Alternative 1.	**Water Quality:** Because Alternative 3 also includes the construction of a new MSF and the relative area of soil disturbance would be greater to install the tracks and construct the stations, the potential for water quality degradation is greater than for the BRT alternatives. However, the General Construction Permit would still apply and a SWPPP would be developed. The SWPPP would specify BMPs to ensure that water quality standards or waste discharge requirements are not violated even for a larger area of disturbance.	Construction of the LRT Alternative would result in the same impacts as those described above for Alternative 3 with the exceptions pertaining to groundwater supplies and recharge. **Groundwater:** Dewatering would likely be required for the underground stations and could potentially be required for utility relocation or replacement depending on local groundwater levels. Adherence to dewatering requirements of the Los Angeles RWQCB, and minimal water use during construction would ensure that impacts on groundwater would be less than significant under CEQA and the effects would not be adverse under NEPA.	**TSM, Alternatives 1 through 4** None Required.	**TSM Alternative:** **CEQA:** No or less than significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Operation	Given that the bus vehicle miles traveled are not expected to substantially increase and given the possibility that operational improvements may increase bus patronage with a corresponding decrease in passenger car vehicle miles traveled, a significant impact on water quality is not expected.	Operational impacts on water quality due to Alternative 1 would be the same as existing conditions because the project would result in a negligible change in impervious area and there would be no major sources of new pollutants.	See discussion for Build Alternative 1.	Operational impacts on water quality for Alternative 3 would be the same as existing conditions because the project would result in very minor increases in the amount of impervious area.	Operational impacts of Alternative 4 would be the same as Alternative 3, described above, with the exception that there is a potential for flooding at the underground stations proposed under the LRT Alternative.	**TSM, Alternatives 1 through 4** None Required.	**TSM Alternative:** **CEQA:** No or less than significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Cumulative	The TSM Alternative would not result in adverse water resources, hydrological, or water quality impacts. Therefore, it would not result in any meaningful contributions to cumulative impacts in these areas.	Adherence to regulatory and permit requirements would minimize the proposed and related project's adverse water quality impacts. Therefore, there would be a less than significant cumulative impact on water quality as a result of project implementation.	See discussion for TSM Alternative	See discussion for TSM Alternative	See discussion for TSM Alternative	**TSM, Alternatives 1 through 4** None Required.	**TSM, Alternatives 1 through 4:** **CEQA:** No significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
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Safety and Security							
Construction	Given the minor amount of construction that would occur under this alternative and the fact that construction sites would be secured to prevent tampering and vandalism, construction impacts/effects would be minor.	Motorists, pedestrians, and bicyclists would experience additional safety hazards during construction of Alternative 1. Lane closures, traffic detours, and designated truck routes may be required, which could adversely affect emergency vehicle response times. Maintaining an adequate level of signage, construction barriers, and supervision of trained safety personnel as part of the construction team would ensure that pedestrian, bicyclist, and motorist safety is maintained during construction.	Construction effects would be the same as those anticipated to occur under Alternative 1 – Curb-Running BRT.	Construction effects would be greater than Alternative 1 due to the more extensive construction activities.	Construction of Alternative 4 may have temporary adverse effects on public safety and security in the study area.	**TSM Alternative:** None required. **Alternatives 1 through 4:** **MM-SS-1:** Alternate walkways for pedestrians shall be provided around construction staging sites in accordance with American with Disability Act (ADA) requirements. **MM-SS-2:** All pedestrian and bicyclist detour locations around staging sites shall be signed and marked in accordance with the Manual on Uniform Traffic Control Devices "work zone" guidance, and other applicable local and state requirements. **MM-SS-3:** Work plans and traffic control measures shall be coordinated with emergency responders to limit effects to emergency response times.	**TSM Alternative:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Operation	Implementation of the TSM Alternative is not expected to result in substantial increased risk of accidents or collisions, and no substantial adverse or significant impacts are anticipated.	**Pedestrian, Vehicle, and Bicycle Safety:** The removal of Class II bike lanes or replacement with shared lanes would increase the potential for conflicts between bicyclists and motor vehicles, reducing safety, which would be a potentially adverse effect and significant impact. **Security:** The Curb-Running BRT Alternative is not expected to result in a substantial increase in crime and any adverse effects on security are expected to be minor.	**Pedestrian, Vehicle, and Bicycle Safety**: Alternative 2 would result in impacts on pedestrian sidewalk safety, bicycle safety due to the removal of existing bike lanes, and potential impacts on emergency vehicle response time due to turn restrictions and the increased congestion resulting from the removal of mixed-flow travel lanes. Consequently, the adverse safety effects of Alternative 2 could be significant.	See discussion for Alternative 2.	See discussion for Alternative 2. Pedestrian, bicyclist and motor vehicle safety issues apply mostly to proposed at-grade stations and less to underground LRT facilities.	**TSM Alternative:** None required. **Alternatives 1 through 4:** **MM-SS-4:** All stations shall be illuminated to avoid shadows and all pedestrian pathways leading to/from sidewalks and parking facilities shall be well illuminated. In addition, lighting would provide excellent visibility for train operators to be able to react to possible conflicts, especially to pedestrians crossing the tracks. **MM-SS-5:** Proposed station designs shall not include design elements that obstruct visibility or observation nor provide discrete locations favorable to crime; pedestrian access to at-grade stations shall be at ground-level with clear sight lines. **MM-SS-6:** Sidewalk widths shall be designed with the widest dimensions feasible in conformance with the Los Angeles/Metro's adopted "Land Use/Transportation Policy," and with widths exceeding 10 feet; Minimum widths shall not be less than those allowed by the State of California Title 24 access requirements, or the Americans with Disability Act design recommendations. Section 1113A of Title 24 states that walks and sidewalks shall be a minimum of 48 inches (1,219 mm) in width, except that walks serving dwelling units in covered multi-family dwelling buildings may be reduced to 36 inches (914 mm) in clear width except at doors; Accommodating pedestrian movements and flows shall take priority over other transportation improvements, including	**TSM Alternative:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Significant impact **NEPA:** Potentially adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						automobile access; physical improvements shall ensure that all stations are fully accessible as defined in the Americans with Disabilities Act. **MM-SS-7:** Adequate pedestrian queuing and refuge areas and wide crosswalks shall be provided in areas immediately around proposed stations to facilitate pedestrian mobility. **MM-SS-8:** Metro shall coordinate and consult with the LAFD, Los Angeles Police Department (LAPD), and Los Angeles County Sheriff's Department (LASD) to develop safety and security plans for the proposed alignment, parking facilities, and station areas. **MM-SS-9:** Fire separations shall be provided and maintained in public occupancy areas. Station public occupancy shall be separated from station ancillary occupancy by a minimum 2-hour fire-rated wall. The only exception is that a maximum of two station agents, supervisors, or information booths may be located within station public occupancy areas when constructed of approved noncombustible materials and limited in floor area to 100 square feet. **MM-SS-10:** For portions of the alignment where pedestrians and/or motor vehicles must cross the tracks, Metro shall prepare grade crossing applications in coordination with the California Public Utilities Commission (CPUC) and local public agencies, such as LADOT, City of Los Angeles Bureau of Engineering, and the City and County of Los Angeles Fire Departments. Crossings will require approval from the CPUC and will meet applicable CPUC standards for grade crossings. **MM-SS-11:** All proposed LRT stations and related parking facilities shall be equipped with monitoring equipment, which would primarily consist of video surveillance equipment to monitor strategic areas of the LRT stations and walkways, and/or be monitored by Metro security personnel on a regular basis. **MM-SS-12:** Metro shall implement a security plan for LRT operations. The plan shall include both in-car and station surveillance by Metro security or other local jurisdiction security personnel. **MM-SS-13:** Light rail vehicles shall be provided with front and rear safety fenders to increase light rail vehicle safety and minimize or prevent the potential for pedestrians to contact the vehicle coupler and/or fall under the LRT.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						MM-SS-14 (Alternative 4): To reduce potential risk of collisions between LRTs and automobiles on the street portion of Alternative 4, Metro shall coordinate with the CPUC, City and County of Los Angeles traffic control departments, City of Los Angeles Bureau of Engineering, and the City and County of Los Angeles Fire Departments and comply with the Federal Highway Administration's Manual on Uniform Traffic Control Devices for signing and pavement marking treatments. **MM-SS-15 (Alternative 4):** The Metro Fire/Life Safety Committee has developed standard safety-related design criteria to ensure safe and adequate LRT operations in and around LRT underground stations. These criteria, which shall be adhered to, include: 1.Fire alarm protection within the station area; 2.A minimum of two fire emergency routes from each proposed station; 3.Emergency ventilation and lighting; 4.Communication systems between adjoining fire agencies; and 5.A methane detection system for each proposed station. **MM-SS-16 (Alternative 4):** Building construction for underground stations would not be less than Type I Construction, as defined in the Uniform Building Code (UBC). Type I Construction is a category of building construction that sets forth design requirements that provide for safety features such as ventilation, additional egress routes, lighting, etc. **MM-SS-17 (Alternative 4):** Proposed stations having more than two levels below grade or more than 80 feet to the lowest occupied level from grade shall require protected level separation or other protection features to provide safe egress to the exits. **MM-SS-18 (Alternative 4):** The diverse needs of the traveling public, including senior citizens, disabled citizens, and low-income citizens, shall be addressed through a formal educational and outreach campaign. The campaign shall target these diverse community members to educate them on proper system use and benefits of LRT ridership.	

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Cumulative Impacts	Because the TSM Alternative would consist of low-cost transit service improvements and very minor physical improvements, which could have a beneficial operational effect on congestion, and no or minimal other safety and security impacts, it would not contribute to any significant adverse safety and security cumulative impacts.	**Pedestrian, Vehicle, and Bicycle Safety:** Implementation of Alternative 1 would result in impacts, after mitigation, on bicycle safety due to the removal of existing bike lanes. Consequently, the adverse safety effects of Alternative 1 combined with the effects of other projects in the study area that reduce bicycle access and safety could be cumulatively significant.	**Pedestrian, Vehicle, and Bicycle Safety:**Alternative 2 would result in impacts, after mitigation, on pedestrian sidewalk safety, bicycle safety due to the removal of existing bike lanes, and potential impacts on emergency vehicle response time due to turn restrictions and the increased congestion resulting from the removal of mixed-flow travel lanes. Consequently, the adverse safety effects of Alternative 2 combined with the effects of other projects in the study area that decrease sidewalk width, increase traffic congestion, or reduce bicycle access and safety could be cumulatively significant.	**Pedestrian, Vehicle, and Bicycle Safety:** Alternative 3 would result in impacts, after mitigation, on pedestrian sidewalk safety, bicycle safety due to the removal of existing bike lanes, and potential impacts on emergency vehicle response time due to turn restrictions and the increased congestion resulting from the removal of mixed-flow travel lanes. Consequently, the adverse safety effects of Alternative 3 combined with the effects of other projects in the study area that reduce sidewalk widths, increase congestion, or reduce bicycle access and safety, could be cumulatively significant.	**Pedestrian, Vehicle, and Bicycle Safety:** Alternative 4 would result in impacts, after mitigation, on pedestrian sidewalk safety, bicycle safety, and emergency vehicle response time. Consequently, the adverse safety effects of this alternative, combined with the effects of other projects in the study area that reduce sidewalk widths, increase congestion, or reduce bicycle access and safety, could be cumulatively significant.	**TSM Alternative:** None required. **Alternatives 1 through 4:** MM-SS-1 through MM-SS-13 listed above	**TSM Alternative:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Significant impact **NEPA:** Adverse effect
Parklands and Community Facilities							
Construction	Given the very limited extent of potential physical improvements, construction activities would likely have no or very minimal impacts on any nearby parklands and community facilities.	The Curb-Running BRT Alternative would not result in the physical acquisition, displacement, or relocation of parklands and community facilities to implement the proposed transportation improvements. Construction activities could result in a range of impacts on nearby parklands and community facilities including air quality, noise, visual, and traffic impacts.	See discussion for Build Alternative 1.	More extensive construction would be required to construct Alternative 3 facilities, which would include the OCS, TPSSs, and an MSF, than would be required for the BRT alternatives.	Alternative 4 would require the most extensive construction of the four build alternatives because of the subway portion of the alignment. The LRT Alternative would also include construction of OCS, TPSSs, and MSF structures. Those structures or facilities would not be required for the BRT alternatives. As a consequence, Alternative 4 would result in the greatest construction impacts on parklands and community facilities, compared to the other alternatives,.	**TSM Alternative**: None required. **Alternatives 1 through 4:** See the Transportation, Transit, Circulation, and Parking; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security sections of this table for a list of mitigation measures that would mimize construction impacts, including impacts related to parklands and community facilities.	**TSM Alternative:** **CEQA:** Less than significant or beneficial impact **NEPA:** No adverse effect or beneficial effect **Alternative 1:** **CEQA:** potentially significant (air quality) **NEPA:** No adverse effects **Alternative 2:** **CEQA:** Less-than-significant; significant (air quality) **NEPA:** No adverse effect **Alternative 3:** **CEQA:** Less-than-Significant; significant (air quality) **NEPA:** No adverse effect; adverse effect (air quality) **Alternative 4:** **CEQA:** Less-than-Significant; significant (air quality) **NEPA:** No adverse effect; adverse effect (air quality)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Operation	No right-of-way acquisitions would be required and this alternative would not result in the physical acquisition, displacement, or relocation of parklands and community facilities, or result in the substantial disturbance of these facilities from noise, air quality, traffic, or visual impacts.	Operation of curb-running buses is not expected to result in substantial noise, air quality, traffic, or visual impacts on parklands and community facilities. It is not expected that any induced growth due to this alternative would substantially increase the demand for parklands and community facilities and require the construction of new facilities to meet that demand. Other operational impacts, such as noise impacts, are expected to be less than significant.	Operational impacts would be the same as those described above for Alternative 1. However, under this alternative, unlike Alternative 1, the median BRT lanes would be barrier separated from adjacent mixed-flow traffic lanes. As a consequence of the reduced access and because of the increased congestion that would occur along the corridor due to the reduction in the number of mixed-flow lanes, impacts on emergency vehicle access within the corridor would be potentially significant. Unless otherwise prohibited, U-turns would be allowed from signalized left-turn lanes on Van Nuys Boulevard; therefore, vehicles that need to turn left to access parklands and community facilities would continue to have access through U-turns from signalized left-turn lanes.	The operational impacts of Alternative 3 would be the same as those described for Alternative 2. with the exception being that Alternative 3 would result in higher noise levels and greater impacts on nearby land uses than would occur under the BRT alternatives described above.	The operational impacts of Alternative 4 would be the same as those described above for Alternative 3., except the operational noise and traffic impacts would be less than Alternative 3 because the subway portion (south of Sherman Way to Parthenia Street) of the Alternative 4 alignment would avoid the at-grade impacts of Alternative 3 for that section of the alignment.	**TSM Alternative:** None required. **Alternatives 1 through 4:** See the Transportation, Transit, Circulation, and Parking; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security sections of this table for a list of mitigation measures that would mimize operational impacts, including impacts related to parklands and community facilities. See Chapter 3, Transportation, Transit, Circulation, and Parking; Section 4.5, Visual Quality and Aesthetics; Section 4.6, Air Quality; Section 4.8, Noise and Vibration; and Section 4.14, Safety and Security.	**TSM Alternative:** **CEQA:** Less than significant or beneficial impact **NEPA:** No adverse effect or beneficial effect **Alternative 1:** **CEQA:** Less than significant impact **NEPA:** No adverse effect **Alternative 2:** **CEQA:** Less than significant impact; significant (emergency vehicles) **NEPA:** Adverse effect (emergency vehicles) **Alternative 3:** **CEQA:** Less than significant impact; significant (emergency vehicle access and visual impacts on sensitive viewers) **NEPA:** Not adverse; adverse (emergency vehicle access and visual impacts on sensitive viewers) **Alternative 4:** **CEQA:** Less than significant impact; significant (emergency vehicle access and visual impacts on sensitive viewers) **NEPA:** Not adverse; adverse (emergency vehicle access and visual impacts on sensitive viewers)
Cumulative	The TSM Alternative would have no or negligible adverse effects on parklands and community facilities. As a consequence, the TSM Alternative would not contribute in any appreciable way to cumulative impacts on parklands and community facilities that might occur due to other projects in the study area.	Alternative 1 would result in no impacts related to the physical acquisition, displacement, or relocation of parkland and community facilities. During construction, the build alternatives could result in short and temporary noise, air quality, traffic, and visual impacts from construction activities and equipment; and reduced access and delayed emergency response resulting from temporary sidewalk, lane, and road closures, and temporary removal of parking. The conversion of mixed-flow lanes to dedicated lanes or guideways for transit vehicles would increase congestion and reduce access for emergency vehicle response. This potentially substantial adverse effect and	See discussion for Alternative 1.	The cumulative impacts that could occur due to implementation of Alternative 3 would be the same as those described above for Alternative 1, except Alternative 3 would result in potentially significant operational visual impacts on sensitive viewers at parklands and community facilities; it could contribute to significant cumulative visual impact on these resources, unlike the BRT alternatives.	See discussion for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** See the Transportation, Transit, Circulation, and Parking; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security sections of this table for a list of mitigation measures that would mimize cumulative impacts, including impacts related to parklands and community facilities. See Chapter 3, Transportation, Transit, Circulation, and Parking; Section 4.5, Visual Quality and Aesthetics; Section 4.6, Air Quality; Section 4.8, Noise and Vibration; and Section 4.14, Safety and Security.	**TSM Alternative:** **CEQA:** No significant impact **NEPA:** No adverse effect **Alternatives 1 and 2:** **CEQA:** Significant impact **NEPA:** Adverse effect **Alternatives 3 and 4:** **CEQA:** Significant impact (visual) **NEPA:** Adverse effect (visual)

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
		significant impact, combined with the impacts of other related projects in the project study area (e.g., housing and mixed-use development) that could increase traffic and consequently result in delayed emergency vehicle response, could be cumulatively considerable.					
Historic, Archaeological, and Paleontological Resources							
Historic Resources - Construction	The TSM Alternative would include relatively low-cost transit service improvements that would require only light construction equipment, and any construction would be of very short duration. Therefore, no construction or vibration effects on historic properties are anticipated.	Under Alternative 1, historic properties that have a potential to be affected by construction of proposed bus stations are far enough (more than 25 feet) away from proposed construction areas, such that any equipment used would not exceed the FTA damage risk vibration limits. Therefore, this alternative would not result in adverse effects on any historic properties during construction.	The construction or upgrading of the stations and BRT guideway would not involve any changes to individual properties. Additionally, under Alternative 2, most of the historic properties within the Area of Potential Effects (APE) that have a potential to be affected by the construction of proposed bus stations are located far enough (more than 25 feet) away from the proposed construction areas such that any equipment used would not exceed the FTA damage risk vibration limits. The one historic property located less than 25 feet away from a proposed BRT stop is made of reinforced concrete construction, and can therefore withstand vibration levels of 0.5 in/sec peak particle velocity (PPV).	The construction of the 28 stations and two of the three possible MSF sites would not involve any changes to individual properties. However, development of one of the MSF sites would require the acquisition and demolition of one historic property. One historic property is located less than 25 feet away from a proposed stop, but is made of reinforced concrete construction and can therefore withstand vibration levels of 0.5 in/sec PPV.	The construction of the stations and MSF under this alternative could affect two historic properties. Two properties would be demolished under Alternative 4 with MSF Option A, and one of those two properties would be demolished under Alternative 4 with MSF Options B and C. All of the historic properties that have a potential to be affected by the construction of proposed above-ground stations are located far enough (more than 25 feet) away from the proposed construction areas such that any equipment used would not exceed the FTA damage risk vibration limits. Pile drivers could be used in the construction of underground stations, which could produce vibration levels that could affect one historic property. However, the property is located far away enough that equipment used would not exceed the FTA damage risk vibration limits.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternatives 1 and 2:** **CEQA:** No significant impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Significant impact **NEPA:** Adverse effect
Historic Resources – Operation	The TSM Alternative would involve low-cost transit service improvements such as increased bus frequencies. These operational improvements would have no impact on any historic properties.	Visual impacts are the only impacts that could occur due to operation of Alternative 1. Under Criterion v, this alternative would not result in atmospheric or audible elements that could diminish significant historic features of any of the properties. There are 10 historic properties in the APE. Five of the properties have a potential to be affected due to the introduction of visual elements under Alternative 1; however, Alternative 1 would not cause an adverse effect on any historic properties.	See discussion for Alternative 1. Of the 10 historic properties in the APE, four have the potential to be affected under Alternative 2.	The operational effects that could occur to historic properties under Alternative 3 would be potential visual effects due to OCS, TPSS, and MSF facilities. There are 10 historic properties within the APE. There is the potential for operational effects due to the introduction of new visual elements on seven of the 10 properties. However, no adverse visual impacts would occur.	See discussion for Alternative 3. Alternative 4 would include an OCS, TPSS, and MSF facilities. There are 10 historic properties within the APE. There is the potential for operational effects due to the introduction of new visual elements on five of the 10 properties. However, no adverse visual impacts would occur.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less-than-Significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Historic Resources – Cumulative	Under the TSM Alternative, there would be no adverse effects or impacts to historic properties; therefore, this alternative would not contribute to cumulative impacts on the properties identified as part of this study or as a result of any other planned projects within the region.	Under the Curb-Running BRT Alternative, there would be no adverse effects or impacts to historic properties; therefore, this alternative would not contribute to cumulative impacts on the properties identified as part of this study.	Under the Median-Running BRT Alternative, there would be no adverse effects or impacts to historic properties; therefore, this alternative would not contribute to cumulative impacts on these properties.	Due to the types of resources that are proposed for demolition, it does not appear that similar property types within the region would be demolished as a result of the related projects within the study area. Therefore, Alternative 3, in conjunction with the other related projects within the study area, is not expected to result in the cumulative loss of the remaining collection of similar property types. Therefore, no significant cumulative impacts to historic resources would occur.	Cumulative historic resource impacts are the same as those described for Alternative 3.	See construction mitigation measures two rows above.	**TSM, Alternative 1 and 2:** **CEQA:** No significant impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less-than-Significant impact **NEPA:** No adverse effect
Archaeological Resources – Construction	The TSM Alternative would result in no or very minimal excavation activities. Thus, no construction impacts to archaeological resources are anticipated.	The Curb-Running BRT Alternative would involve excavation during station upgrades and sidewalk widening and removal. Archaeological sites 19-001124 and 19-002681 are both located in the footprint of this alternative, however, in areas that do not appear to involve construction. There is a low potential for ground-disturbing activities to expose and affect previously unknown significant cultural resources. Grading and trenching, as well as other ground-disturbing actions, have the potential to damage or destroy previously unidentified and potentially significant cultural resources within the project area. No human remains have been previously discovered in the APE, and no burials or cemeteries are known to occur within the APE. However, construction would involve earth-disturbing activities, and it is still possible that human remains may be discovered, possibly in association with archaeological sites.	Archaeological construction impacts are the same as those for Alternative 1.	Archaeological construction impacts are the same as those for Alternative 1, but with just archaeological site 19-002681 within the project area. No archaeological resources are recorded within the three proposed MSF sites, and thus Alternative 3 has a low potential for ground-disturbing activities to expose and affect previously unknown significant archeological resources.	The LRT Alternative would involve shallow excavations for bus stop platform construction in the median, station upgrades and sidewalk widening. Archaeological sites 19-001124 and 19-002681 are both located in the footprint of this alternative, however in areas that do not appear to involve construction. This alternative requires extensive excavations, although previous ground disturbance at tunnel, plaza, station, and sidewalk locations has probably destroyed subsurface archaeological resources. Other impacts are the same as those described under Alternative 3.	**Alternatives 3 and 4:** **MM-AR-1:** Within the site areas and a 500-foot buffer zone, monitoring by a qualified archaeologist and culturally affiliated Native American shall be conducted within the project APE during all initial ground-disturbing activities. If, during cultural resources monitoring, the archaeologist determines that the sediments being excavated have been previously disturbed and are unlikely to contain significant cultural materials, the archaeologist shall request that monitoring be reduced or eliminated. If buried cultural resources such as flaked or ground stone, historic debris, or human remains are inadvertently discovered during ground-disturbing activities, work shall stop in that area and within 100 feet of the find. Metro will notify the FTA, ACHP, and SHPO of those actions that it proposes to avoid, minimize, or mitigate adverse effects. Treatment measures for items that are not associated with human remains typically include development of avoidance strategies, capping with fill material, or mitigation of impacts through data recovery programs such as excavation or detailed documentation. Consulting parties will have 48 hours to provide their views on the proposed actions. The FTA will ensure that timely filed recommendations of consulting parties are taken into account prior to granting approval of the measures that Metro will implement to resolve adverse effects. Metro shall carry out the approved measures prior to resuming construction activities in the location of the discovery. Metro will ensure that the expressed wishes of Native American individuals, tribes, and organizations are taken into consideration when decisions are made	**TSM Alternative:** **CEQA:** No significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						regarding the disposition of Native American archaeological materials and records relating to Indian tribes. **MM-AR-2:** If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. If the resources are determined to be significant, Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, Metro will notify FTA and SHPO within 48 hours of the discovery to determine the appropriate course of action. Additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. **MM-AR-3:** If human remains are discovered that are thought to be Native American, Metro and the FTA shall consult with the affected Native American individuals, tribes, and organizations regarding the treatment of cultural remains and artifacts. These shall be treated in accordance with the requirements of the California Health and Safety Code. If the county coroner/medical examiner determines that the human remains are or may be of Native American origin, then the discovery shall be treated in accordance with the provisions of PRC 5097.98 (a) – (d), which provides for the notification of human remains and associated grave goods.	
Archaeological Resources – Operation	The operational improvements proposed under the TSM Alternatives would have no impact on archaeological resources or human remains.	Operation of the Curb-Running BRT Alternative would result in no impacts or effects on archaeological resources.	Operation of Alternative 2 would not result in any impacts or effects on archaeological resources.	Operation of Alternative 3 would result in no impacts or effects on archaeological resources.	The LRT Alternative would result in no operational impacts or effects on archaeological resources.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternatives 1 through 4:** **CEQA:** No significant impact **NEPA:** No adverse effect
Archaeological Resources - Cumulative	Under the TSM Alternative, there would be no adverse effects or impacts to archaeological resources; therefore, this alternative would not contribute to cumulative impacts on the properties identified as part of this study.	Under the Curb-Running BRT Alternative, there would be no adverse effects or impacts to historic properties; therefore, this alternative would not contribute to cumulative impacts on the properties identified as part of this study.	Under the Median-Running BRT Alternative, there would be no adverse effects or impacts to archaeological resources or human remains; therefore, this alternative would not contribute to cumulative impacts on archaeological resources as part of this study.	Related and other proposed projects in the study area, i.e., the San Fernando Valley, could require earthmoving activities during construction that could disturb or result in the destruction of archaeological resources, a potentially significant impact.	This alternative would not contribute to cumulative impacts on archaeological resources as part of this project or as a result of any other planned projects within the region. However, although the LRT Alternative is not expected to result in impacts to previously	See construction mitigation measures two rows above.	**TSM Alternative:** **CEQA:** No significant impact **NEPA:** No adverse effect **Alternatives 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
				However, under the Low-Floor LRT Alternative, the potential for encountering significant archaeological resources is considered to be low.	identified archaeological resources in the study area, this alternative has a higher potential for encountering significant archaeological resources than the other build alternatives because of the depth and extent of excavation proposed.		
Paleontological Resources – Construction	Only shallow grading activities for bus stops amenities and signalization improvements may be required under the TSM Alternative. Typically these sorts of excavations are less than five feet deep and in California, Holocene valley deposits are typically more than eight feet deep. Assuming construction impacts are less than eight feet deep, there would be no construction impacts to paleontological resources associated with the TSM Alternative.	The Curb-Running BRT Alternative would involve excavation within the Quaternary alluvium during station upgrades and sidewalk widening and removal. All earthmoving activities are anticipated to be restricted to the shallow, surficial sediments, which are too young in age to contain fossils. This alternative would have no impact on paleontological resources.	The Median-Running BRT Alternative would involve shallow excavation within the Quaternary alluvium during bus stop platform construction in the median, station upgrades, and sidewalk widening. These shallow earthmoving activities would not affect paleontological resources, since the sediments that would be disturbed by construction are too young in age to contain fossils.	Construction impacts would be the same as those described for the BRT alternatives. No paleontological resources are recorded within the three proposed MSF sites. Although there has been prior construction in these MSF sites, fossils in valley areas are located subsurficially. New impacts into native sediments for MSF sewer and water lines as well as for underground storage tanks may result in significant impacts/adverse effects to paleontological resources	The LRT Alternative would involve shallow excavations for bus stop platform construction in the median, station upgrades and sidewalk widening. There would be 14 stations, three of which would be underground. Shallow earthmoving activities would not affect paleontological resources, since the affected sediments are too young in age to contain fossils. However deeper excavations have the potential to significantly affect the paleontologically sensitive Quaternary older alluvium that underlies the surficial Quaternary alluvium at variable depths across the project area. Pleistocene fossils are known from the Quaternary older alluvium at depths between14 and 100 feet below the surface in the San Fernando Valley. No paleontological resources are recorded within the three proposed MSF sites. New impacts into native sediments for MSF sewer and water lines as well as for underground storage tanks may result in significant impacts to paleontological resources.	**TSM and Alternatives 1 through 3:** **MM-PR-1:** Metro shall retain the services of a qualified paleontologist (minimum of graduate degree, 10 years of experience as a principal investigator, and specialty in vertebrate paleontology) to oversee execution of this mitigation measure. Metro's qualified principal paleontologist shall then develop a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) acceptable to the collections manager of the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County. Metro will implement the PRMMP during construction. The PRMMP will clearly demarcate the areas to be monitored and specify criteria. At the completion of paleontological monitoring for the proposed project, a paleontological resources monitoring report will be prepared and submitted to the Natural History Museum of Los Angeles County to document the results of the monitoring activities and summarize the results of any paleontological resources encountered. The PRMMP shall include specifications for processing, stabilizing, identifying, and cataloging any fossils recovered as part of the proposed project. Metro's qualified principal paleontologist shall prepare a report detailing the paleontological resources recovered, their significance, and arrangements made for their curation at the conclusion of the monitoring effort. **Alternative 4:** **MM-PR-2:** Prior to the start of construction a qualified Principal Paleontologist shall prepare a Paleontological Mitigation Plan (PMP) that includes the following requirements: • All project personnel involved in ground-disturbing activities shall receive paleontological resources awareness training before beginning work. • Excavations, excluding drilling, deeper than 8 feet below the current surface in the Quaternary alluvium shall be periodically spot checked to determine when older sediments conducive to fossil preservation are encountered. Once the	**TSM, Alternatives 1 and 2:** **CEQA:** No significant impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
						paleontologically sensitive older alluvium is reached, a qualified paleontologist shall perform full-time monitoring of construction. Should sediments in a particular area be determined by the paleontologist to be unsuitable for fossil preservation, monitoring shall be suspended in those areas. A paleontologist shall be available to be on call to respond to any unanticipated discoveries and may adjust monitoring based on the construction plans and field visits. • Sediment samples from the Quaternary older alluvium shall be collected and screened for microfossils. • Recovered specimens shall be stabilized and prepared to the point of identification. Specimens shall be identified to the lowest taxonomic level possible and transferred to an accredited repository for curation along with all associated field and lab data. • Upon completion of project excavation, a Paleontological Mitigation Report (PMR) documenting compliance shall be prepared and submitted to the Lead Agency under CEQA.	
Paleontological Resources – Operation	The operational improvements proposed under the TSM Alternative would have no impact on paleontological resources.	Operation of the Curb-Running BRT Alternative would result in no impacts or effects on paleontological resources.	Operation of Alternative 2 would not result in any impacts or effects on paleontological resources.	Operation of Alternative 3 would result in no impacts or effects on paleontological resources.	The LRT Alternative would result in no operational impacts or effects on paleontological resources.	**TSM, Alternative 1 through 4:** None required.	**TSM, Alternative 1 through 4:** **CEQA:** No impact **NEPA:** No adverse effect
Paleontological Resources – Cumulative	No impacts to paleontological resources would occur under the TSM Alternative; therefore, this alternative would not contribute to any cumulative paleontological resources impacts.	Under the Curb-Running BRT Alternative, there would be no adverse effects or impacts to paleontological resources; therefore, this alternative would not contribute to cumulative impacts on paleontological resources as part of this project or as a result of any other planned projects within the region.	Under the Median-Running BRT Alternative, there would be no adverse effects or impacts to paleontological resources; therefore, this alternative would not contribute to cumulative impacts on paleontological resources as part of this project or as a result of any other planned projects within the region.	Other related projects could require excavation to depths containing fossil bearing soils and could result in the destruction of fossil resources, a potentially significant impact. However, potential impacts to any paleontological resources that may be encountered during construction of Alternative 3 would be mitigated to a less-than-significant-level.	Impacts are the same as those described under Alternative 3. Only the subsurficial excavations of the LRT Alternative have the potential to affect fossils as this is the only build alternative with excavations planned in geologically sensitive units.	**TSM, Alternatives 1 and 2:** None required **Alternative 3:** MM-HRPR-2 1 through and MM-HRPR-92 **Alternative 4:** MM-HRPR-1 through and MM-HRPR-92	**TSM, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Environmental Justice							
Construction	Given the very limited extent of potential physical improvements, construction activities would likely have no or very minimal impacts on the social, economic, and physical conditions of the communities and neighborhoods in the project study area. These minor temporary effects are anticipated to affect all communities within the project study area comparably, regardless of the block groups' socioeconomic or demographic characteristics.	**Mobility and Access Impacts:** Construction of curb-running BRT stations and the transit alignment would require temporary sidewalk, lane, and road closures, and temporary removal of parking. These closures could reduce pedestrian, bicycle, and vehicle access to areas along the project corridor. These temporary effects are anticipated to affect all communities within the project	Construction impacts would be the same as those described for Alternative 1.	Construction of Alternative 3 would be more extensive but impacts would be generally the same as those described for the BRT alternatives, with the following exceptions: **Displacement of Businesses, Housing, and People:** Alternative 3 would require full or partial acquisition of 65 to 90 parcels, depending on which MSF site is selected. The majority of the	Alternative 4 would require the most extensive construction of the four build alternatives because of the subway portion of the alignment. As a consequence, Alternative 4 would result in the greatest construction impacts compared to the other alternatives.	**TSM Alternative:** None required **Alternatives 1 through 4**: See the following sections in this table for measures to reduce or avoid potential construction impacts on local communities, including environmental justice populations: Transportation, Transit, Circulation, and Parking; Real Estate and Acquisitions; Communities and Neighborhoods; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security.	**TSM Alternative:** **NEPA:** No effect **Alternatives 1 through and 4:** **NEPA:** No disproportionately high and adverse effects on environmental justice populations would occur

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
		study area and communities adjacent to the project study area comparably. **Social and Economic Impacts:** Construction activities would likely result in a decrease in accessibility to many businesses and could reduce on-street and off-street parking, which may negatively affect business activity levels because the number of customers may temporarily decline. Construction activities would take place throughout the project corridor, and the temporary decrease in accessibility would affect all businesses comparably. **Physical Impacts:** Construction activities could result in noise, dust, odors, and traffic delays. Local neighborhoods, businesses, and community facilities may be inconvenienced temporarily, and community activities could be disrupted by construction. Construction of Alternative 1 may also result in several visual impacts and temporary effects on public safety and security within the project study area. Since the project would comply with regulatory requirements and measures would be implemented to mitigate construction impacts and because the potential effects are anticipated to affect all communities within the project study area comparably, regardless of the block groups' socioeconomic or demographic characteristics, Alternative 1 would not result in disproportionately high and adverse effects on minority or low-income populations with respect to construction.		acquisitions would be from light manufacturing and commercial properties that are occupied by automobile repair, supply businesses, and other general commercial retail uses. These businesses are located in low-income and/or minority neighborhoods and therefore, the displacement impacts of Alternative 3 would be predominantly borne by an environmental justice population. However, within the larger surrounding urban area, it is anticipated that there would be enough available properties to accommodate most, if not all, of the displaced businesses. Additionally, all communities within the project study area would be affected and the impacts suffered by the environmental justice populations would not be appreciably more severe or greater in magnitude than the adverse effects that would be suffered by the non-environmental justice populations.			

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Operation	**Mobility and Access Impacts:** The TSM Alternative would be expected to result in beneficial changes to existing mobility and access in the project study area. Therefore, the TSM Alternative would not result in any adverse mobility and access effects on minority or low-income populations. **Social and Economic Impacts:** Under the TSM Alternative, enhanced bus frequencies would provide an increased availability of transit service, which could stimulate the local economy by facilitating access to local businesses. The additional bus service could result in a beneficial impact on low-income individuals that do not own a vehicle and that rely on public transportation. All businesses within the project study area would be affected comparably, regardless of socioeconomic or demographic characteristics. Therefore, the TSM Alternative would not result in disproportionate effects on, or fewer benefits for minority or low-income populations with respect to social and economic conditions. **Physical Impacts:** This alternative would not achieve circulation improvements within the existing community that would be expected as a result of the proposed build alternatives. The existing and projected transportation deficiencies would be experienced comparably among local and regional travelers, regardless of socioeconomic or demographic characteristics. Therefore, the TSM Alternative would not result in effects on minority or low-income populations with respect to physical conditions.	**Mobility and Access Impacts:** Alternative 1would enhance connections to public transportation within the project study area and across the region. The curb-running BRT would be available to all communities throughout the project study area as well as communities adjacent to the project study area, regardless of socioeconomic or demographic characteristics. Under Alternative 1, the Metro Rapid 761 bus would no longer operate on Van Nuys Boulevard from north of San Fernando Road to Foothill Boulevard, a distance of 1.5 miles. This entire segment of roadway is adjacent to block groups containing minority and low-income populations. Metro Local Line 233, however, would continue to operate along the same segment of Van Nuys Boulevard. Passengers using Local Line 233 would be able to use the same method of payment as with Rapid 761, fares between the two lines are comparable, and riders who qualify for Metro transportation subsidy programs would be able to utilize the subsidy regardless of which line they are using. Therefore, Alternative 1 would not result in disproportionate effects on, or fewer benefits for minority or low-income with respect to availability of public transportation. Under Alternative 1, curbside parking along the entire 9.2 miles (in the northbound and southbound directions) of the project corridor would be prohibited from early morning to early evening, which could affect vehicle access to businesses and community resources. However, available adjacent on-street parking and/or off-street parking areas can meet the weekday and weekend on-street parking demand for the area.	Operational impacts would be the same as those described for Alternative 1, with the following exceptions: **Mobility and Access Impacts:** Implementation of Alternative 2 would require restrictions on motor vehicle movements, which would be required to accommodate the median-running BRT facilities and eliminate conflicts between BRT vehicles and other traffic on the roadway. Travelers along the project corridor would be similarly affected by prohibited left turn lanes, regardless of trip origin. Therefore, Alternative 2 would not result in disproportionate effects on, or result in fewer benefits for, minority or low-income populations with respect to prohibited left turns (and associated changes in access). Current pedestrian movements across roadways at existing signal-controlled crosswalks would be maintained; however, other pedestrian crossings along Van Nuys Boulevard at unsignalized intersections would be prohibited to avoid potential conflicts between pedestrians and median-running BRT vehicles. However, adequate pedestrian facilities, sidewalks, and crosswalks would be provided to ensure access and safety. As a consequence, Alternative 2 would not result in disproportionate effects on, or fewer benefits for, minority or low-income populations with respect to pedestrian access. Under Alternative 2, a barrier would be installed to prevent illegal pedestrian crossings of the BRT guideway. These barriers would not substantially affect access between the existing communities and neighborhoods in the project study area. Therefore, Alternative 2 would not result in disproportionately high and adverse effects on minority or low-income populations with respect to physical divisions.	The operational impacts of Alternative 3 would be the same as those described for Alternative 2, with the exceptions noted below: **Changes in Pedestrian and Bicycle Access:** On Van Nuys Boulevard between the Metro Orange Line and El Dorado Avenue in the community of Pacoima, the existing 13-foot-wide sidewalks on each side of the roadway would be narrowed to 10 feet to accommodate the installation of the Low-Floor LRT/Tram facilities. These modifications are not expected to substantially interfere with pedestrian access along the project corridor. For that reason and because these effects are anticipated to affect all communities within the project study area comparably, regardless of the block groups' socioeconomic or demographic characteristics, Alternative 3 would not result in disproportionately high and adverse effects on minority or low-income populations with respect to changes in pedestrian access. **Changes in Visual Character:** New median fences and OCS, in particular, would introduce additional vertical elements that could substantially change the existing visual character and quality within the project corridor, especially for residents, pedestrians, and bicyclists, who would be expected to have high viewer sensitivity to their surroundings. However, these proposed elements would be distributed relatively evenly throughout the project corridor. In addition, individuals traveling from outside the project study area would also be affected by these visual impacts. Therefore, Alternative 3 would not result in disproportionate visual effects on minority or low-income populations.	Operational impacts associated with Alternative 4 would be slightly greater those described for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** See MM-CN-1 in the Communities and Neighborhoods section (Section 4.4)of this table as well as other measures in other sections of this EIS/EIR listed in the following sections of this table: Transportation, Transit, Circulation, and Parking; Real Estate and Acquisitions; Communities and Neighborhoods; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security.	**TSM Alternative:** **NEPA:** No effect **Alternatives 1 through and 4:** **NEPA:** No disproportionately high and adverse effects on environmental justice populations would occur

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
		Under Alternative 1, the existing Class II bike lanes along Van Nuys Boulevard north of Parthenia Street would be removed, which would be expected to affect all bicyclists regardless of socioeconomic or demographic characteristics. Conversion of existing mixed-flow lanes to dedicated BRT lanes would decrease roadway capacity for mixed-flow traffic. As a consequence, this alternative would result in adverse effects on 16 of the 73 study intersections within the corridor, which could reduce access for emergency vehicle response or interfere with emergency evacuation plans. Traffic impacts are anticipated to affect all emergency calls or travelers within the project study area comparably, regardless of socioeconomic or demographic characteristics. **Social and Economic Impacts:** Alternative 1 would not result in disproportionate effects on, or result in fewer benefits for, minority or low-income populations with respect to improved economic conditions. Transit connectivity would be improved throughout the entire project corridor. Therefore, Alternative 1 would not result in disproportionate effects on, or fewer benefits for minority or low-income populations with respect to community cohesion. **Physical Impacts:** Alternative 1 would be designed in compliance with Metro design guidelines to ensure pedestrian, motorist, and bicyclist safety; however, the removal of existing Class II bike lanes would increase the potential for conflicts between bicyclists and motor vehicles. Because the changes to the Class II bike lanes along Van Nuys Boulevard would be expected to affect all bicyclists within an approximate four-mile radius comparably, regardless of		**Safety Impacts and Other Physical Intrusions:** Alternative 3 could result in a potential for collisions between pedestrians and Low-Floor LRT/Tram vehicles at median stations. The introduction of Low-Floor LRT/Tram vehicles into mixed-flow traffic lanes on San Fernando Road, just north of Wolfskill Street, could result in a potential for similar collisions at intersection pedestrian crossings. Illegal crossings by pedestrians could also result in potential safety hazards. Pedestrian traffic control and channelization techniques would be used to control pedestrian movements at intersections and encourage the use of designated pedestrian crossings. Metro would prepare grade crossing applications in coordination with local public agencies to further increase safety and reduce the potential for conflicts, accidents, and collisions. Therefore, Alternative 3 would not result in disproportionate effects on minority or low-income populations with respect to pedestrian safety.			

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
		socioeconomic or demographic characteristics, disproportionately high and adverse effects on environmental justice populations are not anticipated.					
Cumulative	The TSM Alternative would not result in effects on minority or low-income populations; therefore, this alternative would not contribute to cumulative impacts on environmental justice communities.	Although Alternative 1 would not result in disproportionately high and adverse effects on minority or low-income populations, other planned or proposed projects in the corridor could. The potential for cumulative effects to occur due to those related projects in combination with implementation of Alternative 1 would depend on the location of the related projects and their proximity to environmental justice populations; the magnitude, timing, and duration of potential impacts; and whether measures could be implemented to reduce any adverse effects that might occur due to the related projects.	Cumulative impacts would be the same as those described for Alternative 1.	The cumulative impacts would be to the same as those that would occur under Alternatives 1 and 2 above, with the exception that under Alternative 3, displacement impacts would be borne by predominantly minority and low-income populations. Other related projects in the study area could also result in business and/or residential displacements that could be borne by predominantly environmental justice populations. However, relocation benefits and assistance would be provided to businesses displaced by the project and may also be provided to businesses displaced by related projects. Additionally, it is anticipated that a majority of displaced businesses and residents could be relocated within the project study area or in surrounding communities.	Cumulative impacts associated with Alternative 4 would be the same as those described for Alternative 3.	**TSM Alternative:** None required **Alternatives 1 through 4:** See MM-CN-1 in the Communities and Neighborhoods section (of this table as well as other measures listed in the following sections of this table: Transportation, Transit, Circulation, and Parking; Real Estate and Acquisitions; Communities and Neighborhoods; Visual Quality and Aesthetics; Air Quality; Noise and Vibration; and Safety and Security.	**TSM Alternative:** **NEPA:** No effect **Alternatives 1 through and 4:** **NEPA:** Depending on the extent and significance of the impacts due to the related projects, there is a potential for disproportionately high and adverse cumulative effects on environmental justice populations
Growth-Inducing Impacts							
Induce substantial population growth in an area either directly or indirectly	Construction activities associated with this alternative would be minimal and no growth inducement impacts would occur. Any temporary or long-term increases in employment that could directly occur would be small. The TSM Alternative would not directly induce substantial growth. Given the relatively minor service and other improvements that could occur and the fact the proposed project is located in a developed urban area, it is unlikely this alternative would indirectly induce any substantial growth.	The proposed increase in construction jobs would not result in substantial increases in project study area populations because there is a large pool of skilled and unskilled construction workers in Los Angeles County within commuting distance of the project. The potential increase in permanent employment would be relatively minor. Therefore, this alternative would not directly induce substantial residential or employment population growth. Also, the alternative would not indirectly induce growth that would substantially change existing land use and development patterns.	Impacts would be the same as those described for Alternative 1.	Construction impacts would be the same as impacts described for the BRT Alternatives. The anticipated increase in long-term employment would be relatively minor and would not result in a significant increase in the project study area population. Therefore, this alternative would not directly induce substantial residential or employment population growth. This alternative may indirectly result in growth along the corridor and within the project study area. However, it would not extend transit service to undeveloped areas and would be located in a developed urban area. Therefore, it would not indirectly induce growth that would substantially change existing land use and development patterns at the corridor level.	Construction impacts would be the same as impacts described for the BRT Alternatives. Direct impacts would be the same as those anticipated to occur under Alternative 3. Alternative 3 would not indirectly induce growth that would result in a substantial change in land use development patterns.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternative 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
Cumulative Impacts	Since the TSM Alternative consists primarily of low-cost transit service improvements and would include only minor physical improvements to the transportation network, it would not induce growth and consequently would not contribute to any cumulative growth inducement effects.	This alternative would not include the development of new housing or businesses that would directly induce growth. Therefore, neither BRT alternative would directly contribute to cumulative growth inducement effects. However, proposed project improvements to the transit system and increases in transportation network efficiency and connectivity could be a catalyst for new development. The indirect growth inducement effects could contribute to the growth inducement effects of other infrastructure projects and new residential and business development projects. This induced growth could be substantial and result in significant adverse impacts. However, this cumulative induced growth is accounted for in local and regional plans.	Impacts would be the same as those described for Alternative 1.	The indirect growth inducement effects of the rail alternatives could contribute to the growth-inducement effects of other infrastructure projects and new residential and business development projects. This induced growth could be substantial and result in significant adverse impacts. However, this cumulative induced growth is accounted for in local and regional plans.	Impacts would be the same as those described for Alternative 3.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternative 1 through 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Real Estate and Acquisitions							
Construction	Construction of the physical improvements would not require any property acquisitions or result in displacement of existing uses. Therefore, no adverse impacts or effects associated with displacements or relocations would occur.	Alternative 1 would involve primarily dedication of the existing curb lanes to bus service. No new facilities beyond bus stop improvements would be required. All improvements associated with Alternative 1 would take place within the existing transportation ROW. Therefore, no impacts associated with acquisitions of property would occur under Alternative 1.	Alternative 2 would not require the permanent acquisition of any property along the project corridor because it would involve primarily dedication of the median lane to bus service. No new facilities beyond bus stop improvements would be required. All improvements associated with Alternative 2 would take place within the existing transportation ROW.	Alternative 3 could require between 65 and 90 acquisitions of properties, most of which would be full acquisitions. Most of the acquisitions that would be required are commercial or industrial properties (MSF Option A would require full acquisition of four residential units). Because the study area and surrounding urban area are almost entirely built out and given the number of existing buildings for sale or lease in the immediate area, it is expected that most of the businesses that would be displaced because of Alternative 3 would relocate to existing commercial buildings. Thus, it is not anticipated that construction of a substantial amount of new commercial development that could result in substantial adverse impacts on the environment would occur.	Alternative 4 could require between 110 and 120 acquisitions of properties, most of which would be full acquisitions. Most of the acquisitions that would be required are commercial or industrial properties (MSF Option A would require the full acquisition of four residential units).	**TSM, Alternatives 1 through 4:** Relocation assistance and compensation for displaced businesses and residences would be provided in compliance with existing laws. No measures beyond those required by law are proposed.	**TSM, Alternatives 1 and 2:** **CEQA:** No impact **NEPA:** No adverse effect **Alternatives 3 and 4:** **CEQA:** Less than significant impact **NEPA:** No adverse effect
Cumulative	The TSM Alternative would not result in the acquisition and displacement of properties. Therefore, it would not contribute to any cumulative impacts.	Alternative 1 would not result in the acquisition and displacement of properties; therefore, it would not contribute to any cumulative impacts.	Alternative 2 would not result in the acquisition and displacement of properties; therefore, it would not contribute to any cumulative impacts.	It is anticipated that the majority of displaced businesses and residents could be relocated within the study area or in surrounding communities. In addition, it is not anticipated that relocated businesses or residences that would be displaced by the project	See discussion under Alternative 3.	**TSM, Alternatives 1 through 4:** None required.	**TSM, Alternative 1 through 4:** **CEQA:** No impacts **NEPA:** No adverse effects

Affected Resource	Effects/Impacts					Mitigation Measures	Level of Significance after Mitigation
	TSM Alternative	Alt. 1 – Curb-Running BRT	Alt. 2 – Median-Running BRT	Alt. 3 – Low-Floor LRT/Tram	Alt. 4 – LRT		
				would require construction of a substantial amount of commercial and industrial development or new housing that would result in substantial adverse indirect impacts. As a consequence, the proposed and related projects are not expected to result in substantial adverse cumulative real estate and acquisitions impacts.			