SEPULVEDA TRANSIT CORRIDOR PROJECT

Economic and Fiscal Considerations Technical Report

April 2025

Metro®

SEPULVEDA TRANSIT CORRIDOR PROJECT

Contract No. AE67085000

Economic and Fiscal Considerations Technical Report

Task 5.24.11

Prepared for:

Metro

Los Angeles County
Metropolitan Transportation Authority

Prepared by:

HTA PARTNERS
HNTB + TAHA + AECOM

777 S. Figueroa Street, Suite 2300
Los Angeles, California 90017

Review		
	Date	**Name**
Originator	03/20/2025	Kendall Myers
Checker	03/20/2025	Steven Greene
Backchecker/Updater	03/20/2025	Steven Edmonds
Verifier	03/20/2025	Steven Greene
QA Review	04/08/2025	Aaron Grisel

April 2025

Table of Contents

Figures

Tables

Abbreviations and Acronyms

ABC	Accelerated Bridge Construction
APM	automated people mover
APTA	American Public Transportation Association
BEA	U.S. Bureau of Economic Analysis
BRT	bus rapid transit
CEQA	California Environmental Quality Act
CIDH	cast-in-drilled hole
DCP	City of Los Angeles Department of City Planning
EDPC	Economic Development Policy Committee
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ERU	Economic Research Unit
ExpressLanes project	I-405 Sepulveda Pass ExpressLanes project
FTIP	Federal Transportation Improvement Program
FY	fiscal year
HRT	heavy rail transit
HTA	HTA Partners
I-10	Interstate 10
I-405	Interstate 405
LADWP	City of Los Angeles Department of Water and Power
LASRE	LA SkyRail Express
LAX	Los Angeles International Airport
LOSSAN	Los Angeles-San Diego-San Luis Obispo
LRT	light rail transit
Metro	Los Angeles County Metropolitan Transportation Authority
MOW	maintenance-of-way
MRDC	Metro Rail Design Criteria
MRT	monorail transit
MSA	Metropolitan Statistical Area
MSF	maintenance and storage facility
NEPA	National Environmental Policy Act
NOP	Notice of Preparation
O&M	operations and maintenance

OPR	Governor's Office of Planning and Research
PPIC	Public Policy Institute of California
Project	Sepulveda Transit Corridor Project
RIMS II	Regional Input-Output Modeling System
ROW	right-of-way
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SCAG	Southern California Association of Governments
SC-GHG	social cost of greenhouse gases
SCORE	Southern California Optimized Rail Expansion
STCP	Sepulveda Transit Corridor Partners
TAZ	Transportation Analysis Zone
TBM	tunnel boring machine
TOC	transit-oriented communities
TOD	transit-oriented development
TPSS	traction power substation
UCLA	University of California, Los Angeles
US-101	U.S. Highway 101
USDOT	U.S. Department of Transportation
VA	U.S. Department of Veteran Affairs
Valley	San Fernando Valley
Westside	Westside of Los Angeles

1 INTRODUCTION

1.1 Project Background

The Sepulveda Transit Corridor Project (Project) is intended to provide a high-capacity rail transit alternative to serve the large and growing travel market and transit needs currently channeled through the Sepulveda Pass and nearby canyon roads between the San Fernando Valley (Valley) and the Westside of Los Angeles. The Project would have a northern terminus with a connection to the Van Nuys Metrolink/Amtrak Station and a southern terminus with a connection to the Los Angeles County Metropolitan Transportation Authority's (Metro) E Line. In addition to providing local and regional connections to the existing and future Metro rail and bus network, the Project is anticipated to improve access to major employment, educational, and cultural centers in the greater Los Angeles area.

In 2019, Metro completed the Sepulveda Transit Corridor Feasibility Study and released the Project's *Final Feasibility Report* (Metro, 2019), which documented the transportation conditions and travel patterns in the Sepulveda corridor; identified mobility problems affecting travel between the Valley and the Westside; and defined the Purpose and Need, goals, and objectives of the Project. Using an iterative evaluation process, the Feasibility Study identified feasible transit solutions that met the Purpose and Need, goals, and objectives of the Project. The Feasibility Study determined that a reliable, high-capacity, fixed guideway transit system connecting the Valley to the Westside could be constructed along several different alignments. Such a transit system, operated as either heavy rail transit (HRT) or monorail transit (MRT), would serve the major travel markets in the Sepulveda Transit Corridor and would provide travel times competitive with the automobile.

1.2 Project Alternatives

In November 2021, Metro released a Notice of Preparation (NOP) of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act, for the Project that included six alternatives (Metro, 2021). Alternatives 1 through 5 included a southern terminus station at the Metro E Line Expo/Sepulveda Station, and Alternative 6 included a southern terminus station at the Metro E Line Expo/Bundy Station. The alternatives were described in the NOP as follows:

- Alternative 1: Monorail with aerial alignment in the Interstate 405 (I-405) corridor and an electric bus connection to the University of California, Los Angeles (UCLA)
- Alternative 2: Monorail with aerial alignment in the I-405 corridor and an aerial automated people mover connection to UCLA
- Alternative 3: Monorail with aerial alignment in the I-405 corridor and underground alignment between the Getty Center and Wilshire Boulevard
- Alternative 4: Heavy rail with underground alignment south of Ventura Boulevard and aerial alignment generally along Sepulveda Boulevard in the San Fernando Valley
- Alternative 5: Heavy rail with underground alignment including along Sepulveda Boulevard in the San Fernando Valley
- Alternative 6: Heavy rail with underground alignment including along Van Nuys Boulevard in the San Fernando Valley and a southern terminus station on Bundy Drive

The NOP also stated that Metro is considering a No Project Alternative that would not include constructing a fixed guideway line. Metro established a public comment period of 74 days, extending from November 30, 2021 through February 11, 2022. Following the public comment period, refinements to the alternatives were made to address comments received. Further refinements to optimize the designs and address technical challenges of the alternatives were made in 2023 following two rounds of community open houses.

In July 2024, following community meetings held in May 2024, Alternative 2 was removed from further consideration in the environmental process because it did not provide advantages over the other alternatives, and the remaining alternatives represent a sufficient range of alternatives for environmental review, inclusive of modes and routes (Metro, 2024a). Detailed descriptions of the No Project Alternative and the five remaining "build" alternatives are presented in Sections 5 through 10.

1.3 Project Study Area

Figure 1-1 shows the Project Study Area. It generally includes Transportation Analysis Zones from Metro's travel demand model that are within 1 mile of the alignments of the four "Valley-Westside" alternatives from the *Sepulveda Transit Corridor Project Final Feasibility Report* (Metro, 2019). The Project Study Area represents the area in which the transit concepts and ancillary facilities are expected to be located. The analysis of potential impacts encompasses all areas that could potentially be affected by the Project, and the EIR will disclose all potential impacts related to the Project.

1.4 Purpose of this Report and Structure

This technical report examines the environmental impacts of the Project as it relates to economic and fiscal impacts and the possible need for eminent domain. It describes existing economic and fiscal conditions in the Project Study Area, the regulatory setting, methodology for impact evaluation, and potential impacts from operation and construction of the project alternatives, including maintenance and storage facility (MSF) site options.

The report is organized according to the following sections:

- Section 1 Introduction
- Section 2 Regulatory and Policy Framework
- Section 3 Methodology
- Section 4 Future Background Projects
- Section 5 No Project Alternative
- Section 6 Alternative 1
- Section 7 Alternative 3
- Section 8 Alternative 4
- Section 9 Alternative 5
- Section 10 Alternative 6
- Section 11 Preparers of the Technical Report
- Section 12 References

Figure 1-1. Sepulveda Transit Corridor Project Study Area

Source: HTA, 2024

2 REGULATORY AND POLICY FRAMEWORK

2.1 Federal

National and local economies are not subject to regulation by any federal agency. Rather, investments and policies are set in an effort to influence market outcomes indirectly through economic policy decisions, land use regulation, and spatially targeted incentives to spur and focus growth.

Multiple federal agencies, however, provide guidance on economic factors when conducting economic assessments. Applicable guidance documents listed in the following sections will be considered in the economic effects assessment.

2.1.1 Office of the Secretary of Transportation

The Office of the Secretary of Transportation focuses on transportation issues and regularly updates guidance on which values to use (during project assessment) to monetize changes in travel time and safety. These values are regularly applied in all of the modal agencies' assessments. Additionally, the *Benefit-Cost Analysis Guidance for Discretionary Grant Programs* (USDOT, 2023) provides guidance on agglomeration economies.[1]

2.1.2 National Highway Traffic Safety Administration

The National Highway Traffic Safety Administration investigates safety defects in motor vehicles, sets and enforces fuel economy standards, helps states and local communities reduce the threat of drunk drivers, promotes the use of safety belts, child safety seats and air bags, investigates odometer fraud, establishes and enforces vehicle anti-theft regulations, conducts research on driver behavior and traffic safety, and provides consumer information on motor vehicle safety topics. Additionally, the administration provides guidance on assessing emissions factors.

2.1.3 Federal Railroad Administration

The Federal Railroad Administration Consolidated Rail Infrastructure and Safety Improvements Program provides funding for Service Development Programs and Individual Projects that are in various stages of development (including final design, construction or preliminary engineering, or compliance with the National Environmental Policy Act [NEPA]). Notice of funding available to Service Development Plans and Individual Projects provides guidance on the economic factors that must be included in such assessments. Economic factors that must be included range from broadly defined economic factors (e.g., the potential of the corridor program to promote economic development) to the public benefit elements (which need to be analyzed and eventually recommended in the Service Development Plan).

2.1.4 Office of Management and Budget, Executive Office of the President

The Office of Management and Budget has provided guidance on the discount rates to be used in benefit-cost analyses and the general approach to identifying benefits and costs. Although the guidance is described in the context of doing a benefit-cost analysis, the discount rates are relevant for discounting the streams of earnings associated with phased implementation of the alternatives.

[1] An agglomeration economy is a localized economy in which many industries, companies, and services that are geographically grouped together benefit as a result of their close proximity to one another.

2.1.5 Multiple Federal Agencies (Interagency Working Group)

The U.S. Environmental Protection Agency (EPA) is a member of the Interagency Working Group and is participating in the update of Social Cost of Greenhouse Gases (SC-GHG) estimates under Executive Order 13990. While this process continues, the EPA Report on the SC-GHG (EPA, 2023) provides guidance on assessing the social benefits of reducing greenhouse gas emissions, or the social costs of increasing such emissions; this is the source recommended in U.S. Department of Transportation's *Benefit-Cost Analysis Guidance for Discretionary Grant Programs* (USDOT, 2023).

2.2 State

State and local economies are not subject to regulation by any state agency. Rather, investments and policies are set in an effort to influence market outcomes indirectly through economic policy decisions, land use regulation, and spatially-targeted incentives to spur and focus growth. Applicable regulation listed in the following section will be considered in the economic effects assessment.

2.2.1 The State of California Department of Finance Economic Research Unit

The California Department of Finance Economic Research Unit (ERU) provides data and analysis that inform the state's economic policy and financial planning. The unit gathers and evaluates key economic indicators, such as employment, housing, and income trends, to guide budgetary decisions and policy development. It plays a role in preparing the state's budget by providing revenue forecasts and assessing the economic impact of legislation. The ERU is responsible for preparing economic forecasts and analyses of various economic developments, advising state departments and local government agencies, providing economic information to the general public, overseeing the regulatory review process.

2.3 Regional

Regional and local economies are not subject to regulation by any regional agency. However, plans and policies are created to influence market outcomes indirectly through economic policy decisions, land use regulation, and spatially targeted incentives to spur and focus growth. Applicable plan documents listed in the following sections will be considered in the economic effects assessment.

2.3.1 Metro Transit-Oriented Communities Policy

In 2016, the City of Los Angeles voters approved Measure M, which marked $120 billion in investment in the Los Angeles County Metropolitan Transportation Authority (Metro) transit system over the next 40 years, including funds for transit operations and maintenance (O&M) and capital costs (Metro, 2016). Measure M includes an expenditure plan for major projects, including the Sepulveda Transit Corridor Project (Project). To maximize the benefits of Measure M investments, Metro developed a Transit-Oriented Communities (TOC) Policy that includes policies and procedures to promote the development of TOCs (Metro, 2018). TOCs differ from transit-oriented development (TOD) in that a TOD is a specific building or development project that is fundamentally shaped by close proximity to transit. Goals of the TOC Policy include prioritizing the development and preservation of transit-adjacent affordable housing, protecting residents and businesses from displacement, and promoting sustained economic vitality.

2.3.2 Southern California Association of Governments Connect SoCal, 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy

The Southern California Association of Governments (SCAG) *Connect SoCal, 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy* (2024-2050 RTP/SCS) (SCAG, 2024a) is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. It embodies a collective vision for the region's future and is developed with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses, and local stakeholders within Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. Additionally, the SCAG *Connect SoCal, Demographics and Growth Forecast Technical Report* forecasts regional, county, jurisdictional, and sub-jurisdictional growth in employment, population, and households (SCAG, 2024b).

2.3.3 County of Los Angeles Board of Supervisors Economic Development Policy Committee

The County of Los Angeles Board of Supervisors established the Economic Development Policy Committee (EDPC) to focus on advancing economic development initiatives within the county. The EDPC provides guidance and oversight for programs and policies aimed at fostering economic growth, supporting local businesses, and creating jobs. This committee plays a key role in aligning the county's economic development efforts with broader goals such as equity, sustainability, and workforce development. By coordinating various economic strategies, the EDPC ensures that economic policies are responsive to the needs of residents and businesses, while promoting long-term economic stability and growth across the county.

2.3.4 Los Angeles County General Plan Economic Development Element

The *Los Angeles County General Plan 2035* (LA County Planning, 2022), adopted in October 2015, provides the policy framework as well as the overall conditions for community development within their respective jurisdictions. This plan establishes goals, policies, guiding principles, and programs to foster healthy, livable, and sustainable communities (refer to Chapter 3: Guiding Principles). The *Los Angeles County General Plan 2035* includes the Land Use Element, Mobility Element, Air Quality Element, Conservation and Natural Resources Element, Parks and Recreation Element, Noise Element, Safety Element, Public Services and Facilities Element, Economic Development Element, and Housing Element, and General Plan Implementation Chapters: General Plan Maintenance, General Plan Implementation Programs, and Goals and Policies Summary. The General Plan Implementation Programs also inform the budget process and will be used to set funding priorities.

The Los Angeles County General Plan – Economic Development Element (Part III, Chapter 14 of the Los Angeles County General Plan [LA County Planning, 2022]) aims to promote economic prosperity and sustainability. Key goals include attracting and retaining diverse industries, protecting industrial land, enhancing infrastructure, fostering revitalization in distressed areas, supporting small businesses, and improving workforce education. The document outlines strategies for achieving these objectives, emphasizing collaboration between public and private sectors, and encouraging the use of environmentally sustainable practices to support long-term growth across various economic sectors in the county.

2.4 Local

Local economies are not subject to regulation by any local agency. Rather, plans and policies are created in an effort to influence market outcomes indirectly through economic policy decisions, land use

regulation, and spatially-targeted incentives to spur and focus growth. Applicable plans documents listed in the following sections will be considered in the economic effects assessment.

2.4.1 City of Los Angeles General Plan Framework Element

The *Citywide General Plan Framework Element* (DCP, 2001), adopted in December 1996 and amended in August 2001, establishes the broad overall policy and direction for the entire *City of Los Angeles's General Plan*. It provides a citywide context and a comprehensive long-range strategy to guide the comprehensive update of the *General Plan's* (DCP, 2001) other elements. The *Citywide General Plan Framework Element's* "smart growth" strategy generally seeks to accommodate growth near transit and other existing infrastructure to assure a sustainable, economically viable future for the City of Los Angeles. The *Citywide General Plan Framework Element's* transportation policies seek to develop transit alignments and station locations that maximize transit service in activity centers. *The Framework Element, Chapter 7 Economic Development* (DCP, 1996) outlines the following fundamental economic development goals, to provide the physical locations and competitive financial environment necessary to attract various types of economic development to Los Angeles, and to encourage the geographic distribution of job growth in a manner supportive of the city's overall planning objectives.

2.4.2 Los Angeles Department of City Planning: Framework Element Chapter 7: Economic Development.

The Los Angeles Department of City Planning's *Framework Element Chapter 7: Economic Development* (DCP, 1996) focuses on the city's economic development strategies, aiming to create a strong and sustainable economy for the city. This chapter outlines policies and programs designed to promote job creation, attract new businesses, and support local industries. It emphasizes the importance of aligning economic growth with land use planning, infrastructure development, and community needs. The document also discusses implementing community focal points and transit centers along with enhancing existing transit facilities. By integrating economic considerations with broader urban planning efforts, the framework seeks to ensure that Los Angeles can achieve balanced economic development while enhancing the quality of life for residents.

3 METHODOLOGY

3.1 CEQA Threshold of Significance

California Environmental Quality Act (CEQA) Guidelines state that social and economic effects shall not be treated as significant effects on the environment (Section 15131 of the CEQA Guidelines).[2] According to the Governor's Office of Planning and Research (OPR), significance thresholds for a given environmental effect are made at the discretion of the lead agency and are the levels at which the lead agency finds the effects of a project to be significant. Potential economic and social effects of the Sepulveda Transit Corridor Project (Project) that may result in physical impacts on the environment are addressed in Section 3.2 of the *Sepulveda Transit Corridor Project Growth Inducing Impacts Technical Report* (Metro, 2025).

3.2 Effects Evaluation

The economic effects assessment will compare the potential for each of the alternatives to cause potentially adverse or beneficial effects on the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area (MSA) and the State of California economies. The following near-term economic effects will be evaluated:

- Economic Output – The increase in economic output added to the Los Angeles-Long Beach-Anaheim MSA and the State of California economies as a result of project construction.
- Earnings – The increase in local wages due to project construction. Workers employed for project construction will spend a portion of wages within the Los Angeles-Long Beach-Anaheim MSA and the State of California economies.
- Jobs – The number of potential jobs (direct and indirect) that will be generated by project construction.

The methodology for estimating the economic output, jobs, and earnings effects will apply Regional Input-Output Modeling System (RIMS II) multipliers to estimated construction costs to assess the construction-related employment and earnings effects of each alternative. These effects will be estimated for the Los Angeles-Long Beach-Anaheim MSA and the State of California. The RIMS II multipliers, developed by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA), will be used to assess direct, indirect, and induced effects on employment and earnings caused by construction activities. These multipliers (which are based on national input-output model data that track the goods and services produced by each industry and the use of goods and services by industries and final users) account for regional supply conditions and the structure of the local economy. They are widely used to assess economic impacts and offer a transparent and defensible approach to assessing such impacts (BEA, 2024).

RIMS II modeling has some limitations that should be considered in conjunction with modeling results. RIMS II is a static model that relies on 2012 national benchmark input-output data as well as regional data from 2021, when the economy was deeply affected by the COVID-19 pandemic. Moreover, RIMS II multipliers are used to forecast the effects on the Project 20+ years into the future. It is likely that the structure of California and Los Angeles' economies will change by the 2040s. These structural economic

[2] CEQA Guidelines refers to Title 14, Division 6, Chapter 3 of the California Code of Regulations and are administrative regulations governing implementation of the California Environmental Quality Act.

changes are not accounted for in the modeling and should be considered when evaluating modeling results.

This report will also evaluate the fiscal effects as a result of project construction, specifically the potential changes to income, sales, and property tax revenues.

3.2.1 Construction Effects

3.2.1.1 Jobs and Earnings

Input-output multipliers for the construction and professional services industries are applied to the estimated project cost to yield an estimate of the total employment needed to build the improvements under the alternatives. The multipliers are calculated using a combination of national input-output data, regional economic data, and industry specific data, to show the change in economic activity when additional capital is added to a specific industry within the study region. The estimated costs for the alternatives will be adjusted before the multipliers are applied as described in Sections 3.2.1.2 through 3.2.1.5.

3.2.1.2 Right-of-Way Costs

Estimated costs for the purchase of additional rights-of-way (ROW) will be omitted from the economic effects assessment, because purchasing ROW is not anticipated to support job creation. Acquiring and selling a property is a transfer of an asset between entities, and there is no economic activity associated with it, except for small real estate/bank fees.

3.2.1.3 Rolling Stock[3] Costs

Estimated expenditures for vehicles will be omitted, since the vehicles would likely be produced outside of the region for which this economic effect assessment will be prepared.

3.2.1.4 Potential Expenditures under the No Project Alternative

Expenditures in the region required for the No Project Alternative are typically separated from those that would be new to the economy under the other alternatives. For example, accounting for reasonably foreseeable future conditions expected to occur if the Project were not approved, expenditures already allocated for other rail transportation construction projects in the region under the No Project Alternative would not be considered new economic stimulus and would therefore not be strictly attributable to the other five alternatives.

However, at this stage of project development, the apportionment of funding sources is subject to change. The Project is expected to be funded by a variety of local, state, and federal sources, including Measure M, which is a Los Angeles (LA) County, voter-approved, no-sunset, half-cent sales tax that funds projects to ease traffic, expand public transportation, and more (Metro, 2016). Measure M partially funds many Metro projects (Metro, 2016a). For this analysis, 100 percent of project costs will be treated as new funding to the region. This assumption will yield an upper limit estimate of economic output due to project construction. The actual economic and fiscal effects from construction of each alternative will likely be lower after expenditures planned under the No Project Alternative, such as the Measure M funds, are removed.

[3] Rolling stock refers to transit vehicles, such as railcars, locomotives, trolley cars, buses, and more.

3.2.1.5 Short-Term Nature of Construction Investment

Because construction jobs are temporary, lasting only for the duration of the construction cycle, they will be reported as person-years of labor (i.e., a job for one person, lasting one year) over the projected construction period. Construction-effect estimates typically differentiate new jobs from those already supported within the region. Because funding or finance sources are not yet known, the assessment will estimate jobs based on the assumptions that all dollars would be those not previously available in the region for passenger rail improvements.

3.2.2 Transit-Sector Employment Effects

Effects from additional operations and maintenance (O&M) jobs and the associated earnings within the transit sector will be considered and discussed qualitatively. These annually recurring effects will begin with the initial year of operation.

These effects will be considered for the Los Angeles-Long Beach-Anaheim MSA and State of California as a whole and not reported by subregion.

3.2.3 Fiscal Effects

The analysis will discuss the potential changes in local or regional tax bases caused by construction and rail operations activities and longer-term market effects for each alternative. The following analysis will be implemented to calculate the expected potential changes in income tax, sales tax, and property tax revenues as a result of project construction:

- Project activities are expected to increase local wage earnings throughout the Affected Area. As discussed in Section 3.2.1.1, RIMS II multipliers will be used to assess direct, indirect, and induced impacts to earnings caused by construction activities.
- An average state income tax rate will be applied to the expected increase in earnings to calculate the potential increase in income tax revenue.
- An expected percentage of household consumer expenditure as a share of after tax income will be used to calculate the expected share of household earnings that will be subject to sales tax. This value will be applied to sales tax rates for Los Angeles County and the State of California to generate the potential increase in sales tax revenue expected as a result of construction activities.
- The acquisition of land, including temporary takes during construction, will be considered and a conservative assumption applied that both partial and full takes would result in property tax loss for the full parcel. These acquisitions would remove the properties from the local tax base, which would reduce annual tax revenue. Effects from loss in property tax revenue will be estimated for both the City of Los Angeles and Los Angeles County.

4 FUTURE BACKGROUND PROJECTS

This section describes planned improvements to highway, transit, and regional rail facilities within the Project Study Area and the region that would occur whether or not the Project is constructed. These improvements are relevant to the analysis of the No Project Alternative and the project alternatives because they are part of the future regional transportation network within which the Project would be incorporated. These improvements would not be considered reasonably foreseeable consequences of not approving the Project as they would occur whether or not the Project is constructed.

The future background projects include all existing and under-construction highway and transit services and facilities, as well as the transit and highway projects scheduled to be operational by 2045 according to the *Measure R Expenditure Plan* (Metro, 2008), the *Measure M Expenditure Plan* (Metro, 2016), the Southern California Association of Governments (SCAG) *Connect SoCal, 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy* (2020-2045 RTP/SCS) (SCAG, 2020a, 2020b), and the Federal Transportation Improvement Program (FTIP), with the exception of the Sepulveda Transit Corridor Project (Project). The year 2045 was selected as the analysis year for the Project because it was the horizon year of SCAG's adopted RTP/SCS at the time Metro released the NOP for the Project.

4.1 Highway Improvements

The only major highway improvement in the Project Study Area included in the future background projects is the Interstate 405 (I-405) Sepulveda Pass ExpressLanes project (ExpressLanes project). This would include the ExpressLanes project as defined in the *2021 FTIP Technical Appendix, Volume II of III* (SCAG, 2021a), which is expected to provide for the addition of one travel lane in each direction on I-405 between U.S. Highway 101 (US-101) and Interstate 10 (I-10). Metro is currently studying several operational and physical configurations of the ExpressLanes project, which may also be used by commuter or rapid bus services, as are other ExpressLanes in Los Angeles County.

4.2 Transit Improvements

Table 4-1Table 4-1 lists the transit improvements that would be included in the future background projects. This list includes projects scheduled to be operational by 2045 as listed in the *Measure R and Measure M Expenditure Plans* (with the exception of the Project) as well as the Inglewood Transit Connector and LAX APM. In consultation with the Federal Transit Administration, Metro selected 2045 as the analysis year to provide consistency across studies for Measure M transit corridor projects. The Inglewood Transit Connector, a planned automated people mover (APM), which was added to the FTIP with *Consistency Amendment #21-05* in 2021, would also be included in the future background projects (SCAG, 2021b). These projects would also include the Los Angeles International Airport (LAX) APM, currently under construction by Los Angeles World Airports. The APM will extend from a new Consolidated Rent-A-Car Center to the Central Terminal Area of LAX and will include four intermediate stations. In addition, the new Airport Metro Connector Transit Station at Aviation Boulevard and 96th Street will also serve as a direct connection from the Metro K Line and Metro C Line to LAX by connecting with one of the APM stations.

During peak hours, heavy rail transit (HRT) services would generally operate at 4-minute headways (i.e., the time interval between trains traveling in the same direction), and light rail transit (LRT) services would operate at 5- to 6-minute headways. During off-peak hours, HRT services would generally operate at 8-minute headways and LRT services at 10- to 12-minute headways. Bus rapid transit (BRT) services would generally operate at peak headways between 5 and 10 minutes and off-peak headways between

10 and 14 minutes. The Inglewood Transit Connector would operate at a headway of 6 minutes, with more frequent service during major events. The LAX APM would operate at 2-minute headways during peak and off-peak periods.

Table 4-1. Fixed Guideway Transit System in 2045

Transit Line	Mode	Alignment Description[a]
Metro A Line	LRT	Claremont to downtown Long Beach via downtown Los Angeles
Metro B Line	HRT	Union Station to North Hollywood Station
Metro C Line	LRT	Norwalk to Torrance
Metro D Line	HRT	Union Station to Westwood/VA Hospital Station
Metro E Line	LRT	Downtown Santa Monica Station to Lambert Station (Whittier) via downtown Los Angeles
Metro G Line	BRT	Pasadena to Chatsworth[b]
Metro K Line	LRT	Norwalk to Expo/Crenshaw Station
East San Fernando Valley Light Rail Transit Line	LRT	Metrolink Sylmar/San Fernando Station to Metro G Line Van Nuys Station
Southeast Gateway Line	LRT	Union Station to Artesia
North San Fernando Valley Bus Rapid Transit Network Improvements	BRT	North Hollywood to Chatsworth[c]
Vermont Transit Corridor	BRT	Hollywood Boulevard to 120th Street
Inglewood Transit Connector	APM	Market Street/Florence Avenue to Prairie Avenue/Hardy Street
Los Angeles International Airport APM	APM	Aviation Boulevard/96th Street to LAX Central Terminal Area

Source: HTA, 2024

[a]Alignment descriptions reflect the project definition as of the date of the Project's Notice of Preparation (Metro, 2021).

[b]As defined in Metro Board actions of July 2018 and May 2021, the Metro G Line will have an eastern terminus near Pasadena City College and will include aerial stations at Sepulveda Boulevard and Van Nuys Boulevard.

[c]The North San Fernando Valley network improvements are assumed to be as approved by the Metro Board in December 2022.

4.3 Regional Rail Projects

The future background projects would include the Southern California Optimized Rail Expansion (SCORE) program, which is Metrolink's Capital Improvement Program that will upgrade the regional rail system (including grade crossings, stations, and signals) and add tracks as necessary to be ready in time for the 2028 Olympic and Paralympic Games. The SCORE program will also help Metrolink to move toward a zero emissions future. The following SCORE projects planned at Chatsworth and Burbank Stations will upgrade station facilities and allow 30-minute all-day service in each direction by 2045 on the Metrolink Ventura County Line:

1. Chatsworth Station: This SCORE project will include replacing an at-grade crossing and adding a new pedestrian bridge and several track improvements to enable more frequent and reliable service.
2. Burbank Station: This SCORE project will include replacing tracks, adding a new pedestrian crossing, and realigning tracks to achieve more frequency, efficiency, and shorter headways.

In addition, the Link Union Station project will provide improvements to Los Angeles Union Station that will transform the operations of the station by allowing trains to arrive and depart in both directions,

rather than having to reverse direction to depart the station. Link Union Station will also prepare Union Station for the arrival of California High-Speed Rail, which will connect Union Station to other regional multimodal transportation hubs such as Hollywood Burbank Airport and the Anaheim Regional Transportation Intermodal Center.

5 NO PROJECT ALTERNATIVE

The only reasonably foreseeable transportation project under the No Project Alternative would be improvements to Metro Line 761, which would continue to serve as the primary transit option through the Sepulveda Pass with peak-period headways of 10 minutes in the peak direction and 15 minutes in the other direction. Metro Line 761 would operate between the Metro E Line Expo/Sepulveda Station and the Metro G Line Van Nuys Station, in coordination with the opening of the East San Fernando Valley Light Rail Transit Line, rather than to its current northern terminus at the Sylmar Metrolink Station.

5.1 Existing Conditions

5.1.1 Population, Housing and Employment Trends

Between 2019 and 2021, the population of Los Angeles County shrank by 0.3 percent (SCAG, 2024a; U.S. Census Bureau, 2021). The decrease in total population over this period is due to a variety of factors, such as rising cost of living, the COVID-19 pandemic, traffic congestion, and a decline in total immigration to the county (PPIC, 2023). This trend includes population changes that occurred during the COVID-19 pandemic, which may affect future population growth projections. The Southern California Association of Governments (SCAG) *Connect SoCal, 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy* (2024-2050 RTP/SCS) predicts that the trend in population decline will not continue in the coming decades (SCAG, 2024a). The SCAG 2024-2050 RTP/SCS also predicts a 2045 population of over 10.7 million (SCAG, 2024a). As shown in Table 5-1, the population of Los Angeles County is forecast to grow by 7.0 percent between 2019 and 2045. This growth rate is slower than the average U.S. growth rate but still maintains healthy population growth to overcome the negative growth factors listed previously.

Table 5-1. No Project Alternative: Historical Population and Future Growth

Area	Population 2019	Population 2021	Change (%)	Average Annual Change (%)	Population 2045	Percent Change (2019-2045)	Average Annual Change (%)
Los Angeles County[a]	10,045,983	10,019,635	-0.3	-0.1	10,746,423	7.0	0.3
City of Los Angeles[a]	3,907,969	3,603,854	-7.8	-4.0	4,294,663	9.9	0.4
Bel Air	7,788	6,541	-16.0	-8.4	8,124	4.3	0.2
Beverly Crest	12,507	10,949	-12.5	-6.4	13,231	5.8	0.2
Brentwood	33,938	33,182	-2.2	-1.1	32,070	-5.5	-0.2
Encino	48,745	51,759	6.2	3.0	51,963	6.6	0.2
Lake Balboa	32,752	33,021	0.8	0.4	35,223	7.5	0.3
Mar Vista	41,443	42,173	1.8	0.9	45,088	8.8	0.3
North Hills	51,179	53,042	3.6	1.8	51,913	1.4	0.1
North Hollywood	115,003	110,848	-3.6	-1.8	128,533	11.8	0.4
North Sherman Oaks	32,326	33,117	2.4	1.2	36,858	14.0	0.5
Palms	38,476	37,208	-3.3	-1.7	45,815	19.1	0.7
Panorama City	73,623	69,077	-6.2	-3.1	73,557	-0.1	0.0
Sawtelle VA	1,138	1,075	-5.5	-2.8	1,215	6.8	0.3
Sherman Oaks	36,208	36,887	1.9	0.9	38,681	6.8	0.3
Sun Valley	80,592	83,923	4.1	2.0	77,928	-3.3	-0.1
Van Nuys	134,086	132,018	-1.5	-0.8	143,397	6.9	0.3

Area	Population 2019	Population 2021	Change (%)	Average Annual Change (%)	Population 2045	Percent Change (2019-2045)	Average Annual Change (%)
West Los Angeles	81,962	73,460	-10.4	-5.3	95,308	16.3	0.6
Westwood[b]	55,031	54,048	-1.8	-0.9	65,665	19.3	0.7
UCLA	16,914	15,595	-7.8	-4.0	19,278	14.0	0.5
City of Santa Monica	93,339	92,820	-0.6	-0.3	96,482	3.4	0.1
Total Community[a,c]	**970,136**	**955,148**	**-1.5**	**-0.8**	**1,041,051**	**7.3**	**0.3**

Source: SCAG, 2024a; U.S. Census Bureau, 2021

[a]Los Angeles County, City of Los Angeles, and Total Community estimates represent data for the entire jurisdiction.

[b]The data for Westwood includes data for UCLA.

[c]Total Community is the sum of communities and cities and does not include the Los Angeles County or City of Los Angeles totals.

Between 2019 and 2045, households in Los Angeles County are projected to increase by 21.3 percent. Table 5-2 contains detailed household projections for Los Angeles County, the City of Los Angeles, and the individual jurisdictions that make up the Project Study Area. Household growth is expected to continue for neighborhoods surrounding the Project Study Area. In particular, North Hollywood, Palms, West Los Angeles, University of California, Los Angeles (UCLA) and Westwood are all expected to experience strong household growth of over 1 percent per year between the years 2019 and 2045.

Table 5-2. No Project Alternative: Future Growth, Households

Area	Households 2019	Households 2045	Change (%)	Average Annual Change (%)
Los Angeles County[a]	3,392,543	4,113,848	21.3	0.74
City of Los Angeles[a]	1,398,624	1,808,395	29.3	0.99
Bel Air	3,004	3,613	20.3	0.71
Beverly Crest	4,937	6,015	21.8	0.76
Brentwood	15,543	16,399	5.5	0.21
Encino	20,013	24,395	21.9	0.76
Lake Balboa	10,920	13,981	28.0	0.95
Mar Vista	18,190	22,374	23.0	0.80
North Hills	14,313	17,463	22.0	0.77
North Hollywood	44,908	58,320	29.9	1.01
North Sherman Oaks	14,658	18,800	28.3	0.96
Palms	18,183	23,853	31.2	1.05
Panorama City	19,915	23,934	20.2	0.71
Sawtelle VA	101	118	16.8	0.60
Sherman Oaks	17,170	20,476	19.3	0.68
Sun Valley	21,428	24,367	13.7	0.50
Van Nuys	45,894	58,053	26.5	0.91
West Los Angeles	37,447	48,927	30.7	1.03
Westwood[b]	18,591	25,474	37.0	1.22
UCLA	1,065	1,674	57.2	1.75
City of Santa Monica	47,047	51,729	10.0	0.37
Total Community[a,c]	**372,262**	**458,291**	**23.1**	**0.80**

Source: SCAG, 2024a

[a]Los Angeles County, City of Los Angeles, and Total Community estimates represent data for the entire jurisdiction.

[b]The data for Westwood includes data for UCLA.

[c]Total Community is the sum of communities and cities and does not include data for Los Angeles County or the City of Los Angeles.

Employment is also expected to increase between 2019 and 2045. The SCAG 2024-2050 RTP/SCS reported an 8.4 percent growth rate in total employment between the years 2019 and 2045 for Los Angeles County (SCAG, 2024a). Nearly 5.5 million jobs are expected within Los Angeles County by 2045. Table 5-3 contains employment data for Los Angeles County, the City of Los Angeles, and the individual jurisdictions that fall within the Project Study Area. Employment numbers included in the table designate employment by establishment, meaning jobs located within the specified geographical area. Employment is expected to grow in most communities by 2045, except for the City of Santa Monica. Major employers and industries nearby include UCLA, UCLA Medical Center, Van Nuys Airport, entertainment companies, and healthcare services.

Table 5-3. No Project Alternative: Future Growth, Employment

Area	Employment 2019	Employment 2045	Change (%)	Average Annual Change (%)
Los Angeles County	5,031,408	5,451,891	8.4	0.31
City of Los Angeles	1,954,906	2,140,282	9.5	0.35
Bel Air	4,127	4,370	5.9	0.22
Beverly Crest	2,096	2,268	8.2	0.30
Brentwood	27,184	27,399	0.8	0.03
Encino	39,436	40,897	3.7	0.14
Lake Balboa	23,872	25,665	7.5	0.28
Mar Vista	7,345	8,143	10.9	0.40
North Hills	13,224	14,075	6.4	0.24
North Hollywood	34,673	39,359	13.5	0.49
North Sherman Oaks	15,296	16,223	6.1	0.23
Palms	12,993	13,985	7.6	0.28
Panorama City	16,963	18,299	7.9	0.29
Sawtelle VA	4556	4635	1.7	0.07
Sherman Oaks	25,607	27,288	6.6	0.24
Sun Valley	35,901	39,121	9.0	0.33
Van Nuys	53,426	58,141	8.8	0.33
West Los Angeles	118,496	125,706	6.1	0.23
Westwood[b]	87,531	92,951	6.2	0.23
UCLA	59385	61,287	3.2	0.12
City of Santa Monica	109,310	109,310	0.0	0.00
Total Community[a,c]	**632,036**	**667,835**	**5.7**	**0.21**

Source: SCAG, 2024a

[a]Total Community is the sum of communities and cities and does not include Los Angeles County or City of Los Angeles data.

[b]The data for Westwood includes data for UCLA.

[c]Los Angeles County, City of Los Angeles, and Total Community estimates represent data for the entire jurisdiction.

5.1.2 Fiscal Trends

The State of California enjoyed healthy tax revenue growth during the previous decade. Table 5-4 illustrates the State of California's tax revenue for 2016, 2020, and 2022, with data sourced from the Federal Reserve Bank of St. Louis (2024). It shows a meaningful increase in both individual income tax and general sales and gross receipts tax over the period. Specifically, individual income tax revenue rose from $80,753 million in 2016 to $146,190 million in 2022. Similarly, general sales and gross receipts tax revenue increased from $39,189 million in 2016 to $52,228 million in 2022. This data highlights the substantial growth in the State of California's tax revenue from 2016 to 2022. Although it is unlikely that tax revenues will continue to grow at the rapid rate seen between 2020 and 2022, it is likely that tax revenue will continue to grow as the State of California's economy expands.

Table 5-4. No Project Alternative: State of California Tax Revenue

Tax Revenue	2016 ($M)	2020 ($M)	2022 ($M)
Individual Income Tax	80,753	84,412	146,190
General Sales and Gross Receipts Tax	39,189	43,650	52,228

Source: Federal Reserve Bank of St. Louis, 2024

$M = millions of dollars

The City of Los Angeles has also experienced significant tax revenue growth during the previous decade. Table 5-5 includes property tax, sales tax, and general fund revenue for the City of Los Angeles for fiscal years (FY) 2016, 2020, and 2023. Property tax rose from $1,708 million in FY 2016 to $2,563 million in FY 2023, sales tax revenue rose from $438 million to $714 million over the same period, and the General Fund revenue for the City of Los Angeles rose from $4,893 million to $7,582 million.

Table 5-5. No Project Alternative: City of Los Angeles Tax Revenue

Tax Revenue	2016 ($M)	FY 2020 ($M)	FY 2023 ($M)
Total Property Tax	1,708	2,261	2,563
Sales Tax	438	525	714
Total General Fund Revenue	4,893	7,009	7,582

Source: Controller's Office, City of Los Angeles, 2017, 2021, 2024

5.2 Environmental Impacts

The No Project Alternative would include all existing, under-construction, and planned projects scheduled to be operational by 2045. This includes Metro Line 761, which would serve as the primary transit option through the Sepulveda Pass. Changes to the Metro Line 761 would require minimal or no construction activities, as the existing Metro bus line would be rerouted to between the Metro E Line Expo/Sepulveda Station and the Van Nuys Metrolink/Amtrak Station. Maintenance activities would primarily occur within developed or paved areas. Therefore, neither construction nor operation of Metro Line 761 would be disruptive enough to induce an adverse effect on the economic or fiscal environment.

The No Project Alternative includes the SCAG 2024-2050 RTP/SCS (SCAG, 2024a) projected regional population, households, and employment estimates, which reflect planned growth within the region. As this growth is anticipated and planned for accordingly, it cannot conflict with future economic or fiscal development. Transportation projects identified in the SCAG 2024-2050 RTP/SCS (2024a) would provide alternative methods to achieving transportation accommodations for the region. However, the No

Project Alternative would result in less connectivity and lower capacity, relative to the project alternatives, for the transportation network throughout the region. As projected in Table 5-1, Table 5-2, and Table 5-3, population, households, and employment are all expected to continue growing at a healthy rate through 2045.

Transit and other transportation projects, including Metro Line 761, support economic growth in the greater SCAG region[4] and enhance the transportation network's capacity. These projects are not intended to directly increase population, households, or employment. However, the additional capacity generated by these infrastructure projects is expected to improve access to the transit network for both the workforce and residents, which would likely support future economic growth, employment, and fiscal revenue generation.

The projects categorized under the No Project Alternative are scheduled for inclusion in the SCAG 2024-2050 RTP/SCS (SCAG, 2024a), Metro's 2020 Long Range Transportation Plan, the 2023 FTIP, and Measure M (Metro, 2016). These initiatives focus on infrastructure and transportation enhancements designed to support and manage the region's anticipated growth. They are not expected to stimulate additional growth. As a result, the No Project Alternative would have minimal effect on economic or fiscal development.

5.3 Mitigation Measures

5.3.1 Construction Effects

No mitigation measures are required.

5.3.2 Operational Effects

No mitigation measures are required.

5.3.3 Impacts After Mitigation

No mitigation measures are required; impacts are less than significant.

[4]The SCAG region encompasses six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 191 cities in an area covering more than 38,000 square miles (SCAG, 2024c).

6 ALTERNATIVE 1

6.1 Alternative Description

Alternative 1 is an entirely aerial monorail alignment that would run along the Interstate 405 (I-405) corridor and would include eight aerial monorail transit (MRT) stations and a new electric bus route from the Los Angeles County Metropolitan Transportation Authority's (Metro) D Line Westwood/VA Hospital Station to the University of California, Los Angeles (UCLA) Gateway Plaza via Wilshire Boulevard and Westwood Boulevard. This alternative would provide transfers to five high-frequency fixed guideway transit and commuter rail lines, including the Metro E, Metro D, and Metro G Lines, the East San Fernando Valley Light Rail Transit Line, and the Metrolink Ventura County Line. The length of the alignment between the terminus stations would be approximately 15.1 miles. The length of the bus route would be 1.5 miles.

The eight aerial MRT stations and three bus stops would be as follows:

1. Metro E Line Expo/Sepulveda Station (aerial)
2. Santa Monica Boulevard Station (aerial)
3. Wilshire Boulevard/Metro D Line Station (aerial)
    a. Wilshire Boulevard/VA Medical Center bus stop
    b. Westwood Village bus stop
    c. UCLA Gateway Plaza bus stop
4. Getty Center Station (aerial)
5. Ventura Boulevard/Sepulveda Boulevard Station (aerial)
6. Metro G Line Sepulveda Station (aerial)
7. Sherman Way Station (aerial)
8. Van Nuys Metrolink Station (aerial)

6.1.1 Operating Characteristics

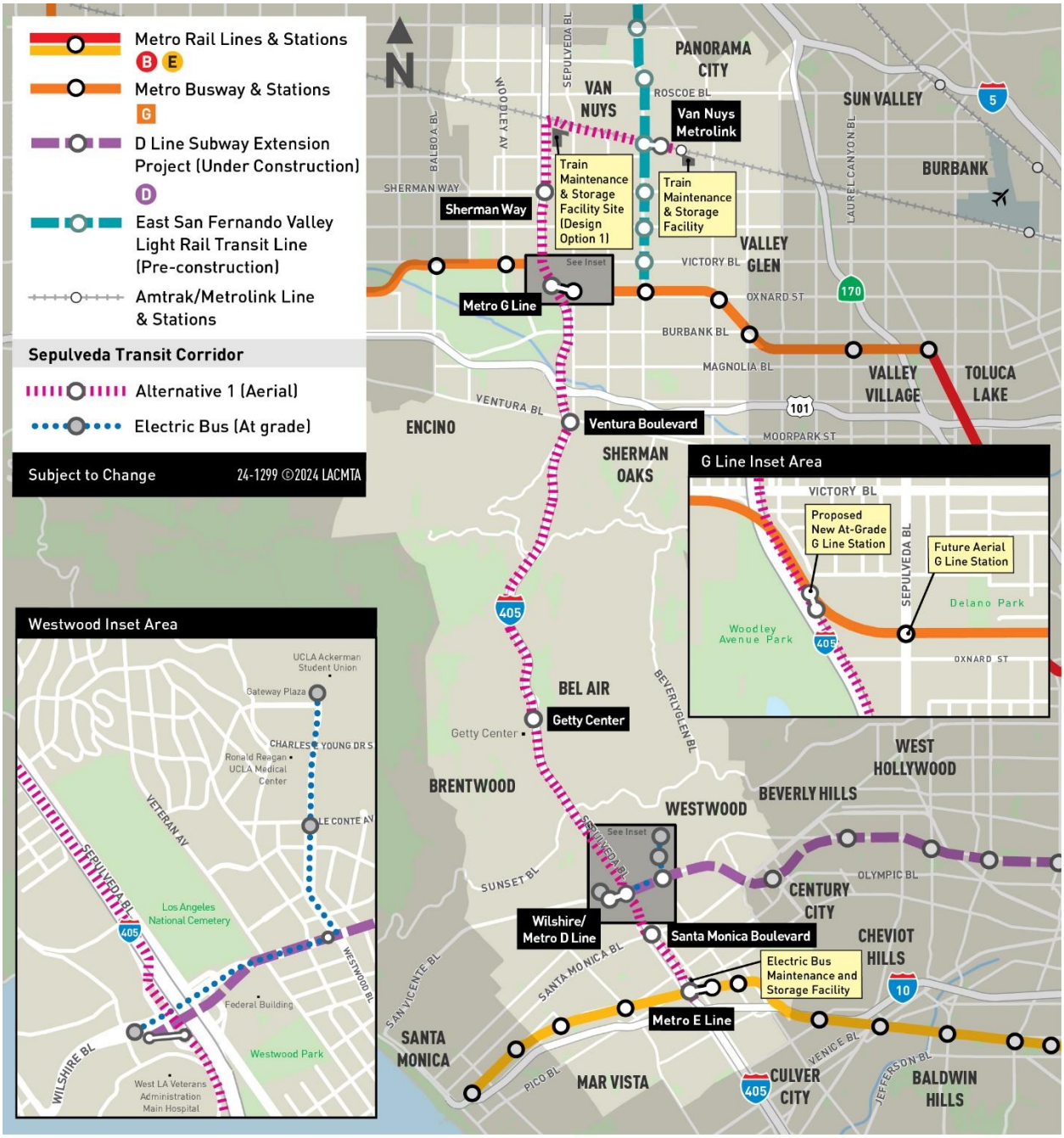
6.1.1.1 Alignment

As shown on Figure 6-1, from its southern terminus at the Metro E Line Expo/Sepulveda Station, the alignment of Alternative 1 would generally follow I-405 to the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor near the alignment's northern terminus at the Van Nuys Metrolink Station. At several points, the alignment would transition from one side of the freeway to the other or to the median. North of U.S. Highway 101 (US-101), the alignment would be on the east side of the I-405 right-of-way and would then curve eastward along the south side of the LOSSAN rail corridor to Van Nuys Boulevard.

The proposed southern terminus station would be located west of the existing Metro E Line Expo/Sepulveda Station and east of I-405 between Pico Boulevard and Exposition Boulevard. Tail tracks would extend just south of the station adjacent to the eastbound Interstate 10 to northbound I-405 connector over Exposition Boulevard. North of the Metro E Line Expo/Sepulveda Station, a storage track would be located off the main alignment north of Pico Boulevard between I-405 and Cotner Avenue. The alignment would continue north along the east side of I-405 until just south of Santa Monica Boulevard, where a proposed station would be located between the I-405 northbound travel lanes and Cotner Avenue. The alignment would cross over the northbound and southbound freeway lanes north of Santa Monica Boulevard and travel along the west side of I-405, before reaching a proposed station within the

I-405 southbound-to-eastbound loop off-ramp to Wilshire Boulevard, near the Metro D Line Westwood/VA Hospital Station.

Figure 6-1. Alternative 1: Alignment



Source: LASRE, 2024; HTA, 2024

An electric bus would serve as a shuttle between the Wilshire Boulevard/Metro D Line Station and UCLA Gateway Plaza. From the Wilshire Boulevard/Metro D Line Station, the bus would travel east on Wilshire Boulevard and turn north on Westwood Boulevard to UCLA Gateway Plaza and make an intermediate stop in Westwood Village near the intersection of Le Conte Avenue and Westwood Boulevard.

North of Wilshire Boulevard, the monorail alignment would transition over the southbound I-405 freeway lanes to the freeway median, where it would continue north over the Sunset Boulevard overcrossing. The alignment would remain in the median to Getty Center Drive, where it would cross over the southbound freeway lanes to the west side of I-405, just north of the Getty Center Drive undercrossing, to the proposed Getty Center Station located north of the Getty Center tram station. The alignment would return to the median for a short distance before curving back to the west side of I-405, south of the Sepulveda Boulevard undercrossing north of the Getty Center Drive interchange. After crossing over Bel Air Crest Road and Skirball Center Drive, the alignment would return to the median and run under the Mulholland Drive Bridge, then continue north within the I-405 median to descend into the San Fernando Valley (Valley).

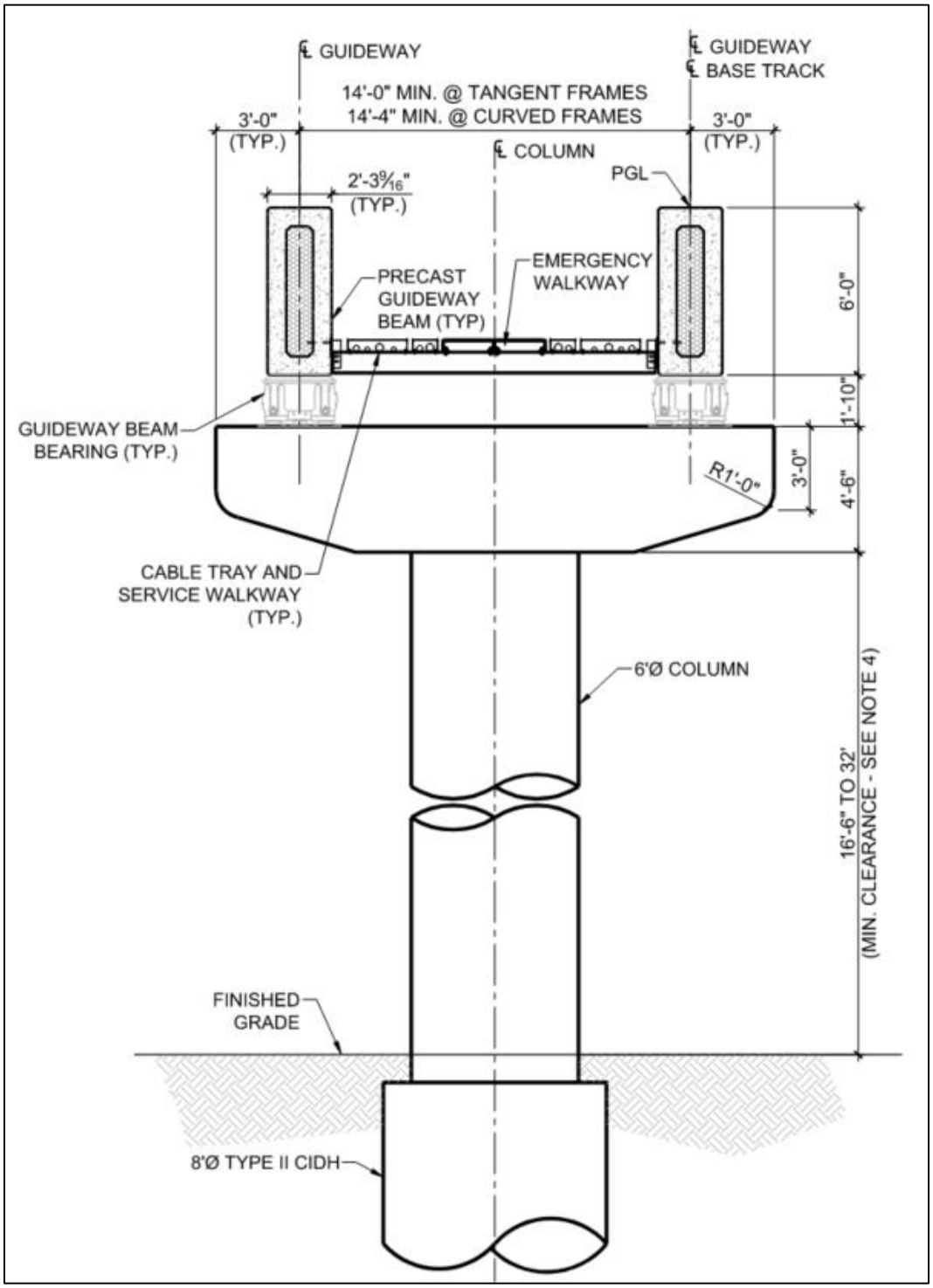
Near Greenleaf Street, the alignment would cross over the northbound freeway lanes and northbound on-ramps toward the proposed Ventura Boulevard Station on the east side of I-405. This station would be located above a transit plaza and would replace an existing segment of Dickens Street adjacent to I-405, just south of Ventura Boulevard. Immediately north of the Ventura Boulevard Station, the alignment would cross over northbound I-405 to the US-101 connector and continue north between the connector and the I-405 northbound travel lanes. The alignment would continue north along the east side of I-405 — crossing over US-101 and the Los Angeles River — to a proposed station on the east side of I-405 near the Metro G Line Busway. A new at-grade station on the Metro G Line would be constructed for Alternative 1 adjacent to the proposed monorail station. These proposed stations are shown on the Metro G Line inset area on Figure 6-1.

The alignment would then continue north along the east side of I-405 to the proposed Sherman Way Station. The station would be located inside the I-405 northbound loop off-ramp to Sherman Way. North of the station, the alignment would continue along the eastern edge of I-405, then curve to the southeast parallel to the LOSSAN rail corridor. The alignment would remain aerial along Raymer Street east of Sepulveda Boulevard and cross over Van Nuys Boulevard to the proposed terminus station adjacent to the Van Nuys Metrolink/Amtrak Station. Overhead utilities along Raymer Street would be undergrounded where they would conflict with the guideway or its supporting columns. Tail tracks would be located southeast of this terminus station.

6.1.1.2 Guideway Characteristics

The monorail alignment of Alternative 1 would be entirely aerial, utilizing straddle-beam monorail technology, which allows the monorail vehicle to straddle a guide beam that both supports and guides the vehicle. Northbound and southbound trains would travel on parallel beams supported by either a single-column or a straddle-bent structure. Figure 6-2 shows a typical cross-section of the aerial monorail guideway.

Figure 6-2. Typical Monorail Guideway Cross-Section



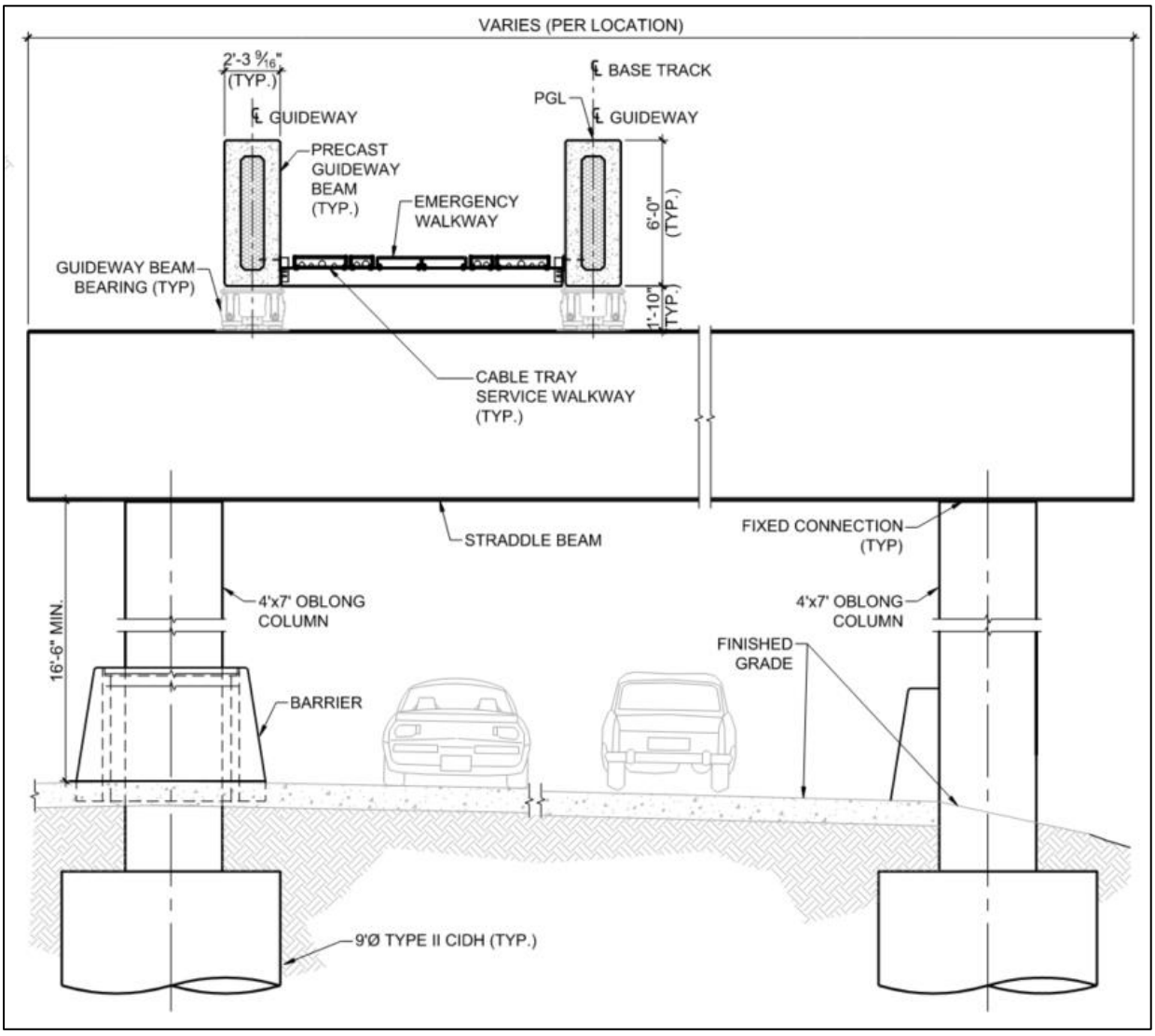
Source: LASRE, 2024

On a typical guideway section (i.e., not at a station), guide beams would rest on 20-foot-wide column caps (i.e., the structure connecting the columns and the guide beams), with typical spans (i.e., the

distance between columns) ranging from 70 to 190 feet. The bottom of the column caps would typically be between 16.5 feet and 32 feet above ground level.

Over certain segments of roadway and freeway facilities, a straddle-bent configuration, as shown on Figure 6-3, consisting of two concrete columns constructed outside of the underlying roadway would be used to support the guide beams and column cap. Typical spans for these structures would range between 65 and 70 feet. A minimum 16.5-foot clearance would be maintained between the underlying roadway and the bottom of the column caps.

Figure 6-3. Typical Monorail Straddle-Bent Cross-Section



Source: LASRE, 2024

Structural support columns would vary in size and arrangement by alignment location. Columns would be 6 feet in diameter along main alignment segments adjacent to I-405 and be 4 feet wide by 6 feet long in the I-405 median. Straddle-bent columns would be 4 feet wide by 7 feet long. At stations, six rows of dual 5-foot by 8-foot columns would support the aerial guideway. Beam switch locations and long-span structures would also utilize different sized columns, with dual 5-foot columns supporting switch

locations and 9-foot- or 10-foot-diameter columns supporting long-span structures. Crash protection barriers would be used to protect the columns. Columns would have a cast-in-drilled-hole (CIDH) pile foundation extending 1 foot in diameter beyond the column width with varying depths for appropriate geotechnical considerations and structural support.

6.1.1.3 Vehicle Technology

Alternative 1 would utilize straddle-beam monorail technology, which allows the monorail vehicle to straddle a guide beam that both supports and guides the vehicle. Rubber tires would sit both atop and on each side of the guide beam to provide traction and guide the train. Trains would be automated and powered by power rails mounted to the guide beam, with planned peak-period headways of 166 seconds and off-peak-period headways of 5 minutes. Monorail trains could consist of up to eight cars. Alternative 1 would have a maximum operating speed of 56 miles per hour; actual operating speeds would depend on the design of the guideway and distance between stations.

Monorail train cars would be 10.5 feet wide, with two double doors on each side. End cars would be 46.1 feet long with a design capacity of 97 passengers, and intermediate cars would be 35.8 feet long and have a design capacity of 90 passengers.

The electric bus connecting the Wilshire Boulevard/Metro D Line Station, Westwood Village, and UCLA Gateway Plaza would be a battery electric, low-floor transit bus, either 40 or 60 feet in length. The buses would run with headways of 2 minutes during peak periods. The electric bus service would operate in existing mixed-flow travel lanes.

6.1.1.4 Stations

Alternative 1 would include eight aerial MRT stations with platforms approximately 320 feet long, elevated 50 feet to 75 feet above the existing ground level. The Metro E Line Expo/Sepulveda, Santa Monica Boulevard, Ventura Boulevard/Sepulveda Boulevard, Sherman Way, and Van Nuys Metrolink Stations would be center-platform stations where passengers would travel up to a shared platform that would serve both directions of travel. The Wilshire Boulevard/Metro D Line, Getty Center, and Metro G Line Sepulveda Stations would be side-platform stations where passengers would select and travel up to one of two station platforms, depending on their direction of travel. Each station, regardless of whether it has side or center platforms, would include a concourse level prior to reaching the train platforms. Each station would have a minimum of two elevators, two escalators, and one stairway from ground level to the concourse.

Station platforms would be approximately 320 feet long and would be supported by six rows of dual 5-foot by 8-foot columns. Station platforms would be covered, but not enclosed. Side-platform stations would be 61.5 feet wide to accommodate two 13-foot-wide station platforms with a 35.5-foot-wide intermediate gap for side-by-side trains. Center-platform stations would be 49 feet wide, with a 25-foot-wide center platform.

Monorail stations would include automatic, bi-parting fixed doors along the edges of station platforms. These doors would be integrated into the automatic train control system and would not open unless a train is stopped at the platform.

The following information describes each station, with relevant entrance, walkway, and transfer information. Bicycle parking would be provided at each station.

Metro E Line Expo/Sepulveda Station

- This aerial station would be located near the existing Metro E Line Expo/Sepulveda Station, just east of I-405 between Pico Boulevard and Exposition Boulevard.
- A transit plaza and station entrance would be located on the east side of the station.
- An off-street passenger pick-up/drop-off loop would be located south of Pico Boulevard west of Cotner Avenue.
- An elevated pedestrian walkway would connect the concourse level of the proposed station to the Metro E Line Expo/Sepulveda Station within the fare paid zone.
- Passengers would be able to park at the existing Metro E Line Expo/Sepulveda Station parking facility, which provides 260 parking spaces. No additional automobile parking would be provided at the proposed station.

Santa Monica Boulevard Station

- This aerial station would be located just south of Santa Monica Boulevard, between the I-405 northbound travel lanes and Cotner Avenue.
- Station entrances would be located on the southeast and southwest corners of Santa Monica Boulevard and Cotner Avenue. The entrance on the southeast corner of the intersection would be connected to the station concourse level via an elevated pedestrian walkway spanning Cotner Avenue.
- No dedicated station parking would be provided at this station.

Wilshire Boulevard/Metro D Line Station

- This aerial station would be located west of I-405 and south of Wilshire Boulevard within the southbound I-405 loop off-ramp to eastbound Wilshire Boulevard.
- An elevated pedestrian walkway spanning the adjacent I-405 ramps would connect the concourse level of the proposed station to a station plaza adjacent to the Metro D Line Westwood/VA Hospital Station within the fare paid zone. The station plaza would be the only entrance to the proposed station.
- The station plaza would include an electric bus stop and provide access to the Metro D Line Station via a new station entrance and concourse constructed using a knock-out panel provided in the Metro D Line Station.
- The passenger pick-up/drop-off facility at the Metro D Line Station would be reconfigured, maintaining the original capacity.
- No dedicated station parking would be provided at this station.

Getty Center Station

- This aerial station would be located on the west side of I-405 near the Getty Center, approximately 1,000 feet north of the Getty Center tram station.
- An elevated pedestrian walkway would connect the concourse level of the proposed station to the Getty Center tram station. The proposed connection would occur outside the fare paid zone.
- The pedestrian walkway would provide the only entrance to the proposed station.

- No dedicated station parking would be provided at this station.

Ventura Boulevard/Sepulveda Boulevard Station

- This aerial station would be located east of I-405, just south of Ventura Boulevard.
- A transit plaza, including two station entrances, would be located on the east side of the station. The plaza would require the closure of a 0.1-mile segment of Dickens Street between Sepulveda Boulevard and Ventura Boulevard, with a passenger pick-up/drop-off loop and bus stops provided south of the station, off Sepulveda Boulevard.
- No dedicated station parking would be provided at this station.

Metro G Line Sepulveda Station

- This aerial station would be located near the Metro G Line Sepulveda Station, between I-405 and the Metro G Line Busway.
- Entrances to the MRT station would be located on both sides of a proposed new Metro G Line bus rapid transit (BRT) station.
- An elevated pedestrian walkway would connect the concourse level of the proposed station to the proposed new Metro G Line BRT station outside of the fare paid zone.
- Passengers would be able to park at the existing Metro G Line Sepulveda Station parking facility, which has a capacity of 1,205 parking spaces. Currently, only 260 parking spaces are used for transit parking. No additional automobile parking would be provided at the proposed station.

Sherman Way Station

- This aerial station would be located inside the I-405 northbound loop off-ramp to Sherman Way.
- A station entrance would be located on the north side of Sherman Way.
- An on-street passenger pick-up/drop-off area would be provided on the north side of Sherman Way west of Firmament Avenue.
- No dedicated station parking would be provided at this station.

Van Nuys Metrolink Station

- This aerial station would be located on the east side of Van Nuys Boulevard, just south of the LOSSAN rail corridor, incorporating the site of the current Amtrak ticket office.
- A station entrance would be located on the east side of Van Nuys Boulevard just south of the LOSSAN rail corridor. A second entrance would be located north of the LOSSAN rail corridor with an elevated pedestrian walkway connecting to both the concourse level of the proposed station and the platform of the Van Nuys Metrolink/Amtrak Station.
- Existing Metrolink station parking would be reconfigured, maintaining approximately the same number of spaces, but 180 parking spaces would be relocated north of the LOSSAN rail corridor. Metrolink parking would not be available to Metro transit riders.

6.1.1.5 Station-to-Station Travel Times

Table 6-1 presents the station-to-station distance and travel times for Alternative 1. The travel times include both run time and dwell time. Dwell time is 30 seconds per station. Northbound and southbound travel times vary slightly because of grade differentials and operational considerations at end-of-line stations.

Table 6-1. Alternative 1: Station-to-Station Travel Times and Station Dwell Times

From Station	To Station	Distance (miles)	Northbound Station-to-Station Travel Time (seconds)	Southbound Station-to-Station Travel Time (seconds)	Dwell Time (seconds)
Metro E Line Station					*30*
Metro E Line	Santa Monica Boulevard	0.9	122	98	—
Santa Monica Boulevard Station					*30*
Santa Monica Boulevard	Wilshire/Metro D Line	0.7	99	104	—
Wilshire/Metro D Line Station					*30*
Wilshire/Metro D Line	Getty Center	2.9	263	266	—
Getty Center Station					*30*
Getty Center	Ventura Boulevard	4.7	419	418	—
Ventura Boulevard Station					*30*
Ventura Boulevard	Metro G Line	2.0	177	184	—
Metro G Line Station					*30*
Metro G Line	Sherman Way	1.5	135	134	—
Sherman Way Station					*30*
Sherman Way	Van Nuys Metrolink	2.4	284	284	—
Van Nuys Metrolink Station					*30*

Source: LASRE, 2024

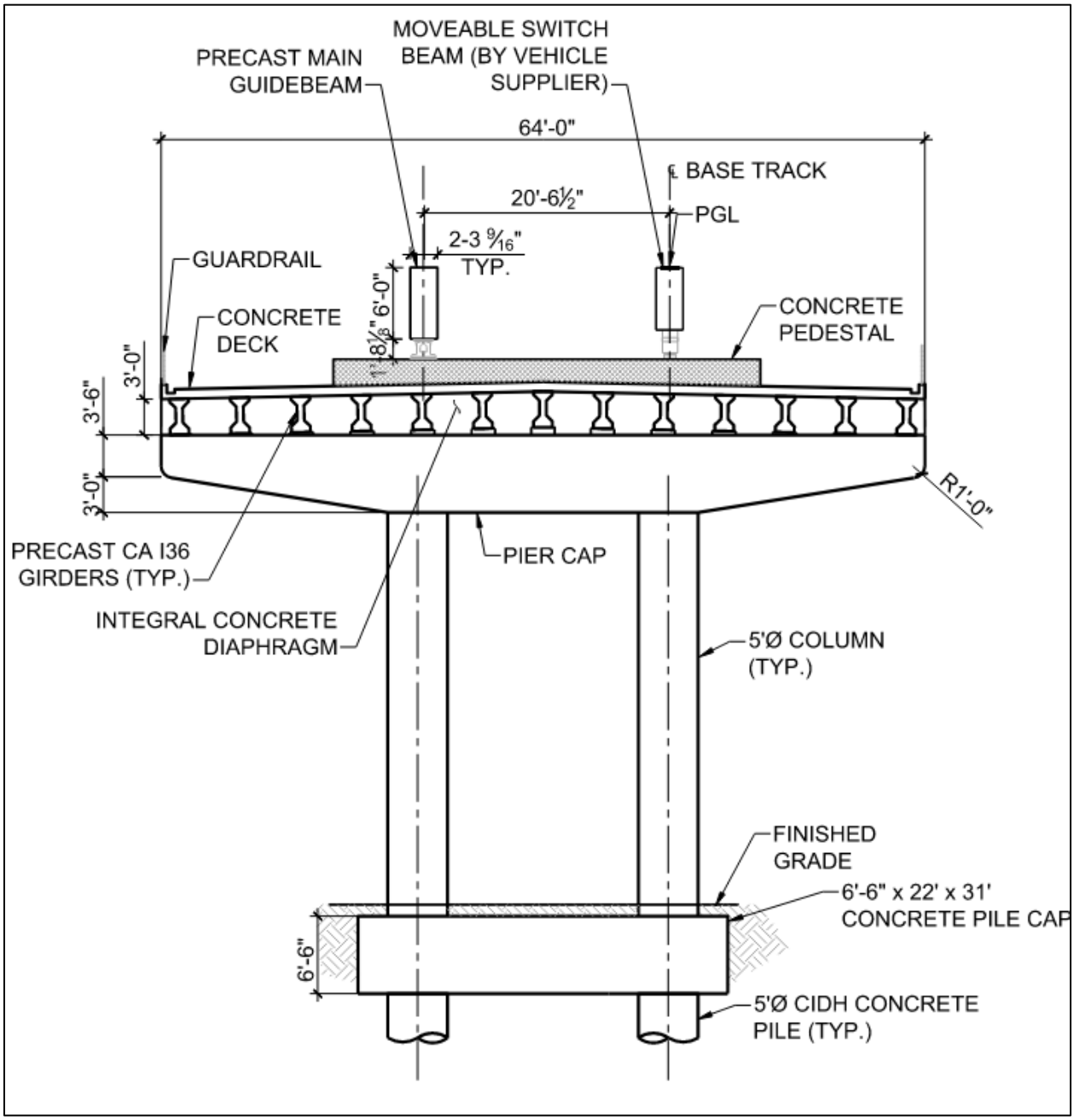
— = no data

6.1.1.6 Special Trackwork

Alternative 1 would include five pairs of beam switches to enable trains to cross over to the opposite beam. From south to north, the first pair of beam switches would be located just north of the Metro E Line Expo/Sepulveda Station. The second pair of beam switches would be located near the Wilshire Boulevard/Metro D Line Station on the north side of Wilshire Boulevard, within the Wilshire Boulevard westbound to I-405 southbound loop on-ramp. A third pair of beam switches would be located in the Sepulveda Pass just south of Mountaingate Drive and Sepulveda Boulevard. A fourth pair of beam switches would be located south of the Metro G Line Station between the I-405 northbound lanes and the Metro G Line Busway. The final pair would be located near the Van Nuys Metrolink Station.

At beam switch locations, the typical cross-section of the guideway would increase in column and column cap width. The column cap at these locations would be 64 feet wide, with dual 5-foot-diameter columns. Underground pile caps for additional structural support would also be required at beam switch locations. Figure 6-4 shows a typical cross-section of the monorail beam switch.

Figure 6-4. Typical Monorail Beam Switch Cross-Section



Source: LASRE, 2024

6.1.1.7 Monorail Maintenance and Storage Facility

MSF Base Design

In the maintenance and storage facility (MSF) Base Design for Alternative 1, the MSF would be located on City of Los Angeles Department of Water and Power (LADWP) property east of the Van Nuys Metrolink Station. The MSF Base Design site would be approximately 18 acres and would be designed to accommodate a fleet of 208 monorail vehicles. The site would be bounded by the LOSSAN rail corridor

to the north, Saticoy Street to the south, and property lines extending north of Tyrone and Hazeltine Avenues to the east and west, respectively.

Monorail trains would access the site from the main alignment's northern tail tracks at the northwest corner of the site. Trains would travel parallel to the LOSSAN rail corridor before curving southeast to maintenance facilities and storage tracks. The guideway would remain in an aerial configuration within the MSF Base Design, including within maintenance facilities.

The site would include the following facilities:

- Primary entrance with guard shack
- Primary maintenance building that would include administrative offices, an operations control center, and a maintenance shop and office
- Train car wash building
- Emergency generator
- Traction power substation (TPSS)
- Maintenance-of-way (MOW) building
- Parking area for employees

MSF Design Option 1

In the MSF Design Option 1, the MSF would be located on industrial property, abutting Orion Avenue, south of the LOSSAN rail corridor. The MSF Design Option 1 site would be approximately 26 acres and would be designed to accommodate a fleet of 224 monorail vehicles. The site would be bounded by I-405 to the west, Stagg Street to the south, the LOSSAN rail corridor to the north, and Orion Avenue and Raymer Street to the east. The monorail guideway would travel along the northern edge of the site.

Monorail trains would access the site from the monorail guideway east of Sepulveda Boulevard, requiring additional property east of Sepulveda Boulevard and north of Raymer Street. From the northeast corner of the site, trains would travel parallel to the LOSSAN rail corridor before turning south to maintenance facilities and storage tracks parallel to I-405. The guideway would remain in an aerial configuration within the MSF Design Option 1, including within maintenance facilities.

The site would include the following facilities:

- Primary entrance with guard shack
- Primary maintenance building that would include administrative offices, an operations control center, and a maintenance shop and office
- Train car wash building
- Emergency generator
- TPSS
- MOW building
- Parking area for employees

Figure 6-5 shows the locations of the MSF Base Design and MSF Design Option 1 for Alternative 1.

Figure 6-5. Alternative 1: Maintenance and Storage Facility Options

Source: LASRE, 2024; HTA, 2024

6.1.1.8 Electric Bus Maintenance and Storage Facility

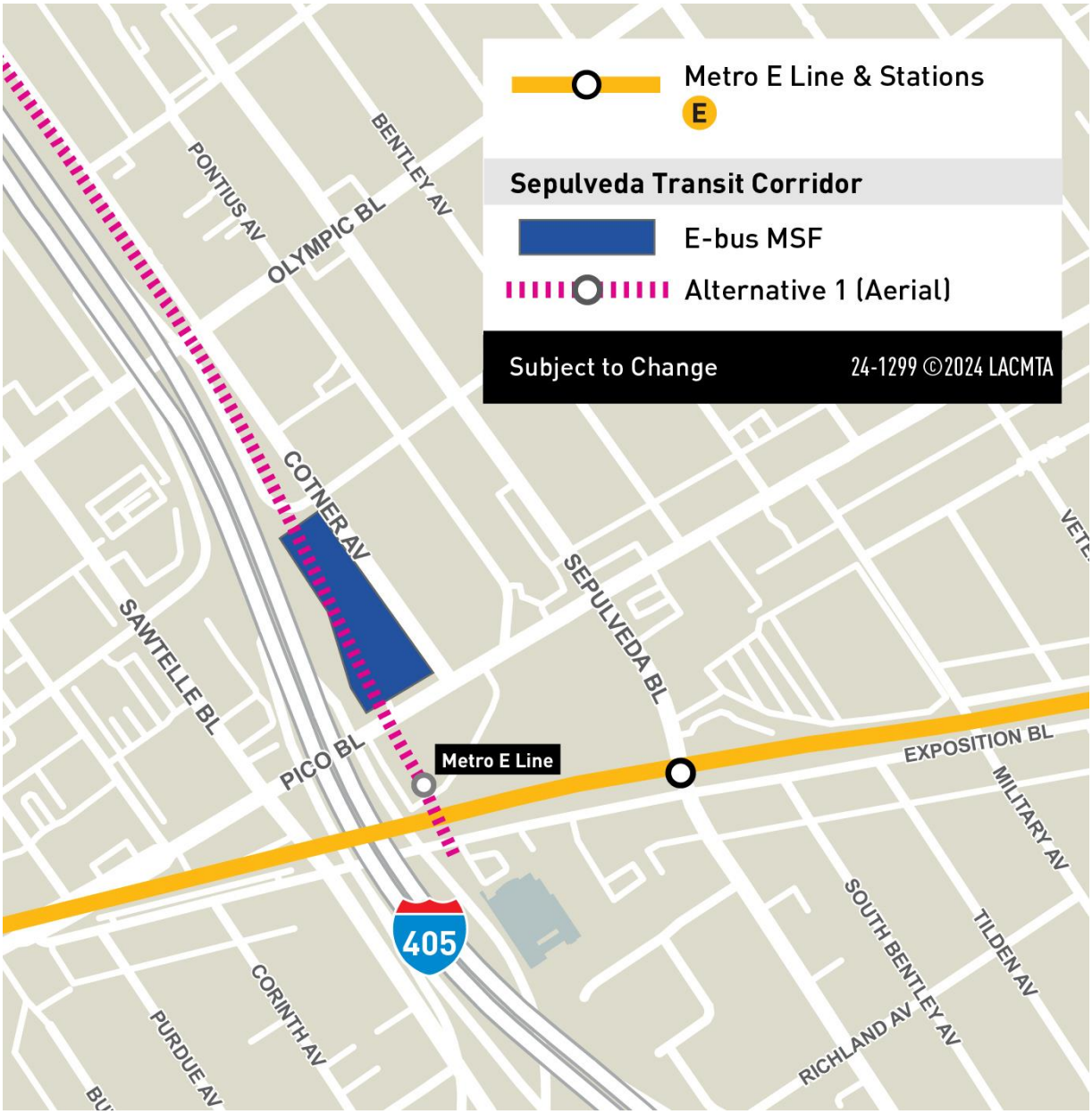
An electric bus MSF would be located on the northwest corner of Pico Boulevard and Cotner Avenue and would be designed to accommodate 14 electric buses. The site would be approximately 2 acres and would comprise six parcels bounded by Cotner Avenue to the east, I-405 to the west, Pico Boulevard to the south, and the I-405 northbound on-ramp to the north.

The site would include approximately 45,000 square feet of buildings and include the following facilities:

- Maintenance shop and bay
- Maintenance office
- Operations center
- Bus charging equipment
- Parts storeroom with service areas
- Parking area for employees

Figure 6-6 shows the location of the proposed electric bus MSF.

Figure 6-6. Alternative 1: Electric Bus Maintenance and Storage Facility



Source: LASRE, 2024; HTA, 2024

6.1.1.9 Traction Power Substations

TPSSs transform and convert high voltage alternating current supplied from power utility feeders into direct current suitable for transit operation. A TPSS on a site of approximately 8,000 square feet would be located approximately every 1 mile along the alignment. Table 6-2 lists the TPSS locations proposed for Alternative 1.

Figure 6-7 shows the TPSS locations along the Alternative 1 alignment.

Table 6-2. Alternative 1: Traction Power Substation Locations

TPSS No.	TPSS Location Description	Configuration
1	TPSS 1 would be located east of I-405, just south of Exposition Boulevard and the monorail guideway tail tracks.	At-grade
2	TPSS 2 would be located west of I-405, just north of Wilshire Boulevard, inside the Westbound Wilshire Boulevard to I-405 Southbound Loop On-Ramp.	At-grade
3	TPSS 3 would be located west of I-405, just north of Sunset Boulevard, inside the Church Lane to I-405 Southbound Loop On-Ramp.	At-grade
4	TPSS 4 would be located east of I-405 and Sepulveda Boulevard, just north of the Getty Center Station.	At-grade
5	TPSS 5 would be located west of I-405, just east of the intersection between Promontory Road and Sepulveda Boulevard.	At-grade
6	TPSS 6 would be located between I-405 and Sepulveda Boulevard, just north of the Skirball Center Drive Overpass.	At-grade
7	TPSS 7 would be located east of I-405, just south of Ventura Boulevard Station, between Sepulveda Boulevard and Dickens Street.	At-grade
8	TPSS 8 would be located east of I-405, just south of the Metro G Line Sepulveda Station.	At-grade
9	TPSS 9 would be located east of I-405, just east of the Sherman Way Station, inside the I-405 Northbound Loop Off-Ramp to Sherman Way westbound.	At-grade
10	TPSS 10 would be located east of I-405, at the southeast quadrant of the I-405 overcrossing with the LOSSAN rail corridor.	At-grade
11	TPSS 11 would be located east of I-405, at the southeast quadrant of the I-405 overcrossing with the LOSSAN rail corridor.	At-grade (within MSF Design Option)
12	TPSS 12 would be located between Van Nuys Boulevard and Raymer Street, south of the LOSSAN rail corridor.	At-grade
13	TPSS 13 would be located south of the LOSSAN rail corridor, between Tyrone Avenue and Hazeltine Avenue.	At-grade (within MSF Base Design)

Source: LASRE, 2024; HTA, 2024

Figure 6-7. Alternative 1: Traction Power Substation Locations

Source: LASRE, 2024; HTA, 2024

6.1.1.10 Roadway Configuration Changes

Table 6-3 lists the roadway changes necessary to accommodate the guideway of Alternative 1. Figure 6-8 shows the location of these roadway changes in the Alternative 1 Study Area, except for I-405 configuration changes, which would occur throughout the corridor.

Table 6-3. Alternative 1: Roadway Changes

Location	From	To	Description of Change
Cotner Avenue	Nebraska Avenue	Santa Monica Boulevard	Roadway realignment to accommodate aerial guideway columns and station access
Beloit Avenue	Massachusetts Avenue	Ohio Avenue	Roadway narrowing to accommodate aerial guideway columns
I-405 Southbound On-Ramp, Southbound Off-Ramp, and Northbound On-Ramp at Wilshire Boulevard	Wilshire Boulevard	I-405	Ramp realignment to accommodate aerial guideway columns and I-405 widening
Sunset Boulevard	Gunston Drive	I-405 Northbound Off-Ramp at Sunset Boulevard	Removal of direct eastbound to southbound on-ramp to accommodate aerial guideway columns and I-405 widening. Widening of Sunset Boulevard bridge with additional westbound lane
I-405 Southbound On-Ramp and Off-Ramp at Sunset Boulevard and North Church Lane	Sunset Boulevard	Not Applicable	Ramp realignment to accommodate aerial guideway columns and I-405 widening
I-405 Northbound On-Ramp and Off-Ramp at Sepulveda Boulevard near I-405 Exit 59	Sepulveda Boulevard near I-405 Northbound Exit 59	Sepulveda Boulevard/ I-405 Undercrossing (near Getty Center)	Ramp realignment to accommodate aerial guideway columns and I-405 widening
Sepulveda Boulevard	I-405 Southbound Skirball Center Drive Ramps (north of Mountaingate Drive)	Skirball Center Drive	Roadway realignment into existing hillside to accommodate aerial guideway columns and I-405 widening
I-405 Northbound On-Ramp at Mulholland Drive	Mulholland Drive	Not Applicable	Roadway realignment into the existing hillside between the Mulholland Drive Bridge pier and abutment to accommodate aerial guideway columns and I-405 widening
Dickens Street	Sepulveda Boulevard	Ventura Boulevard	Vacation and permanent removal of street for Ventura Boulevard Station construction. Pick-up/drop-off area would be provided along Sepulveda Boulevard at the truncated Dickens Street
Sherman Way	Haskell Avenue	Firmament Avenue	Median improvements, passenger drop-off and pick-up areas, and bus pads within existing travel lanes
Raymer Street	Sepulveda Boulevard	Van Nuys Boulevard	Curb extensions and narrowing of roadway width to accommodate aerial guideway columns
I-405	Sunset Boulevard	Bel Terrace	I-405 widening to accommodate aerial guideway columns in the median

Location	From	To	Description of Change
I-405	Sepulveda Boulevard Northbound Off-Ramp (Getty Center Drive interchange)	Sepulveda Boulevard Northbound On-Ramp (Getty Center Drive interchange)	I-405 widening to accommodate aerial guideway columns in the median
I-405	Skirball Center Drive	I-405 Northbound On-Ramp at Mulholland Drive	I-405 widening to accommodate aerial guideway columns in the median

Source: LASRE, 2024; HTA, 2024

Figure 6-8. Alternative 1: Roadway Changes

Source: LASRE, 2024; HTA, 2024

In addition to the changes made to accommodate the guideway, as listed in Table 6-3, roadways and sidewalks near stations would be reconstructed, which would result in modifications to curb ramps and driveways.

6.1.1.11 Fire/Life Safety – Emergency Egress

Continuous emergency evacuation walkways would be provided along the guideway. The walkways would typically consist of structural steel frames anchored to the guideway beams to support non-slip

walkway panels. The walkways would be located between the two guideway beams for most of the alignment; however, where the beams split apart, such as entering center-platform stations, short portions of the walkway would be located on the outside of the beams.

6.1.2 Construction Activities

Construction activities for Alternative 1 would include constructing the aerial guideway and stations, widening I-405, and constructing ancillary facilities. Construction of the transit through substantial completion is expected to have a duration of 6½ years. Early works, such as site preparation, demolition, and utility relocation, could start in advance of construction of the transit facilities.

Aerial guideway construction would begin at the southern and northern ends of the alignment and connect in the middle. Constructing the guideway would require a combination of freeway and local street lane closures throughout the work limits to provide sufficient work area. The first stage of I-405 widening would include a narrowing of adjacent freeway lanes to a minimum width of 11 feet (which would eliminate shoulders) and placing K-rail on the outside edge of the travel lanes to create outside work areas. Within these outside work zones, retaining walls, drainage infrastructure, and outer pavement widenings would be constructed to allow for I-405 widening. The reconstruction of on- and off-ramps would be the final stage of I-405 widening.

A median work zone along I-405 for the length of the alignment would be required for erection of the guideway structure. In the median work zone, demolition of the existing median and drainage infrastructure would be followed by the installation of new K-rail and installation of guideway structural components, which would include full directional freeway closures when guideway beams must be transported into the median work areas during late-night hours. Additional night and weekend directional closures would be required for installation of long-span structures over I-405 travel lanes where the guideway would transition from the median.

Aerial station construction is anticipated to last the duration of construction activities for Alternative 1 and would include the following general sequence of construction:

- Site clearing
- Utility relocation
- Construction fencing and rough grading
- CIDH pile drilling and installation
- Elevator pit excavation
- Soil and material removal
- Pile cap and pier column construction
- Concourse level and platform level falsework for cast-in-place structural concrete
- Guideway beam installation
- Elevator and escalator installation
- Completion of remaining concrete elements such as pedestrian bridges
- Architectural finishes and mechanical, electrical, and plumbing installation

Alternative 1 would require construction of a concrete casting facility for columns and beams associated with the elevated guideway. A specific site has not been identified; however, it is expected that the facility would be located on industrially zoned land adjacent to a truck route in either the Antelope Valley or Riverside County. When a site is identified, the contractor would obtain all permits and approvals necessary from the relevant jurisdiction, the appropriate air quality management entity, and other regulatory entities.

TPSS construction would require additional lane closures. Large equipment including transformers, rectifiers, and switchgears would be delivered and installed through prefabricated modules where possible in at-grade TPSSs. The installation of transformers would require temporary lane closures on Exposition Boulevard, Beloit Avenue, Sepulveda Boulevard just north of Cashmere Street, and the I-405 northbound on-ramp at Burbank Boulevard.

Table 6-4 and Figure 6-9 show the potential construction staging areas for Alternative 1. Staging areas would provide the necessary space for the following activities:

- Contractors' equipment
- Receiving deliveries
- Storing materials
- Site offices
- Work zone for excavation
- Other construction activities (including parking and change facilities for workers, location of construction office trailers, storage, staging and delivery of construction materials and permanent plant equipment, and maintenance of construction equipment)

Table 6-4. Alternative 1: Construction Staging Locations

No.	Location Description
1	Public Storage between Pico Boulevard and Exposition Boulevard, east of I-405
2	South of Dowlen Drive and east of Greater LA Fisher House
3	At 1400 North Sepulveda Boulevard
4	At 1760 North Sepulveda Boulevard
5	East of I-405 and north of Mulholland Drive Bridge
6	Inside of I-405 Northbound to US-101 Northbound Loop Connector, south of US-101
7	ElectroRent Building south of Metro G Line Busway, east of I-405
8	Inside the I-405 Northbound Loop Off-Ramp at Victory Boulevard
9	Along Cabrito Road east of Van Nuys Boulevard

Source: LASRE, 2024; HTA, 2024

Figure 6-9. Alternative 1: Construction Staging Locations

Source: LASRE, 2024; HTA, 2024

6.2 Existing Conditions

6.2.1 Population, Housing, and Employment Trends

Alternative 1 would be within the jurisdictions of the City of Los Angeles, the City of Santa Monica, and the Sawtelle VA community of Los Angeles County. Affected communities identified within the City of Los Angeles include Bel Air, Brentwood, Encino, Mar Vista, North Sherman Oaks, Palms, Panorama City, Van Nuys, West Los Angeles, and Westwood.

For purposes of the economic and fiscal effects analysis, Alternative 1 would include Transportation Analysis Zones (TAZ) from the Southern California Association of Governments' (SCAG) regional growth forecast and census tracts that would intersect the areas within a 0.5-mile radius of the Alternative 1 proposed stations.

The projected population growth from 2019 to 2045 within the TAZs, such as the 23.5 percent increase anticipated near Metro E Line Expo/Sepulveda Station and the 19.3 percent rise around the Westwood Village Bus Stop, highlights the growing demand for efficient and sustainable transit solutions. Detailed population projections are included in Table 6-5. The anticipated 11.4 percent total population increase by 2045 in these areas highlights the growing demand for expanded transit services to accommodate future growth and reduce congestion. Without Alternative 1, it is likely that congestion and strain on the existing travel corridor would increase.

Table 6-5. Alternative 1: Future Population Growth

Area[a]	Population 2019	Population 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (A)	15,892	19,623	23.5	0.81
Santa Monica Boulevard Station (A)	25,848	30,648	18.6	0.66
Wilshire Boulevard/Metro D Line Station (A)	25,235	29,993	18.9	0.67
Wilshire Boulevard/VA Medical Center Station Bus Stop	27,443	30,979	12.9	0.47
Westwood Village Bus Stop	34,465	41,128	19.3	0.68
UCLA Gateway Plaza Bus Stop	32,773	39,049	19.1	0.68
Getty Center Station (A)	10,197	9,840	-3.5	-0.14
Ventura Boulevard/Sepulveda Boulevard Station (A)	17,721	19,976	12.7	0.46
Metro G Line Sepulveda Station (A)	16,694	18,106	8.5	0.31
Sherman Way Station (A)	28,072	29,664	5.7	0.21
Van Nuys Metrolink Station (A)	25,138	26,151	4.0	0.15
Total[b]	**186,178**	**207,435**	**11.4**	**0.42**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 1 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial

The household growth data for the areas surrounding the proposed Alternative 1 stations show substantial increases by 2045. As shown in Table 6-6., the Metro E Line Expo/Sepulveda Station area is expected to grow by 40.9 percent, and the UCLA Gateway Plaza Bus Stop area by 44.7 percent. Overall, the total number of households across the areas included in Alternative 1 is anticipated to increase by 28.0 percent. Data suggests a rising demand for transportation infrastructure to accommodate the

growing residential population in these areas. Major employers and industries in the region include UCLA, UCLA Medical Center, Van Nuys Airport, entertainment companies, and healthcare services.

Table 6-6. Alternative 1: Future Household Growth

Area[a]	Households 2019	Households 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (A)	6,910	9,739	40.9	1.33
Santa Monica Boulevard Station (A)	12,340	16,179	31.1	1.05
Wilshire Boulevard/Metro D Line Station (A)	11,310	14,807	30.9	1.04
Wilshire Boulevard/VA Medical Center Station Bus Stop	12,591	15,587	23.8	0.82
Westwood Village Bus Stop	8,391	12,040	43.5	1.40
UCLA Gateway Plaza Bus Stop	7,530	10,899	44.7	1.43
Getty Center Station (A)	3,833	4,163	8.6	0.32
Ventura Boulevard/Sepulveda Boulevard Station (A)	7,601	9,767	28.5	0.97
Metro G Line Sepulveda Station (A)	6,202	7,857	26.7	0.91
Sherman Way Station (A)	9,933	12,304	23.9	0.83
Van Nuys Metrolink Station (A)	7,469	9,379	25.6	0.88
Total[b]	**69,593**	**89,108**	**28.0**	**0.96**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 1 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial

Similar to the household and population projections, the employment data for the areas around the proposed Alternative 1 stations indicate a projected increase in jobs by 2045. The Wilshire Boulevard/Metro D Line Station area is expected to experience a 9.6 percent increase in employment, while the Sherman Way Station area anticipates a 10.7 percent rise by 2045. The overall employment growth across all areas is projected at 6.6 percent. These figures suggest an expanding job market in the vicinity of the proposed alternative. Detailed employment counts for the relevant TAZs are included in Table 6-7.

Table 6-7. Alternative 1: Future Employment Growth

Area[a]	Employment 2019	Employment 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (A)	24,460	26,473	8.2	0.30
Santa Monica Boulevard Station (A)	27,002	29,382	8.8	0.33
Wilshire Boulevard/Metro D Line Station (A)	36,751	40,265	9.6	0.35
Wilshire Boulevard/VA Medical Center Station Bus Stop	37,371	40,246	7.7	0.29
Westwood Village Bus Stop	79,011	83,550	5.7	0.22
UCLA Gateway Plaza Bus Stop	68,892	71,688	4.1	0.15
Getty Center Station (A)	8,054	8,319	3.3	0.12
Ventura Boulevard/Sepulveda Boulevard Station (A)	23,182	24,264	4.7	0.18
Metro G Line Sepulveda Station (A)	8,726	9,400	7.7	0.29
Sherman Way Station (A)	14,005	15,510	10.7	0.39
Van Nuys Metrolink Station (A)	10,509	11,497	9.4	0.35
Total[b]	**205,397**	**218,962**	**6.6**	**0.25**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 1 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial

6.2.2 Fiscal Trends

The State of California has enjoyed healthy tax revenue growth for the previous decade. Table 6-8 illustrates the State of California's tax revenue for the years 2016, 2020, and 2022, with data sourced from the Federal Reserve Bank of St. Louis (2024). It shows a meaningful increase in both individual income tax and general sales and gross receipts tax from 2016 through 2022. Specifically, individual income tax revenue rose from $80,753 million in 2016 to $146,190 million in 2022. Similarly, general sales and gross receipts tax revenue increased from $39,189 million in 2016 to $52,228 million in 2022. The data highlights the substantial growth in the State of California's tax revenue from 2016 through 2022. Although it is unlikely that tax revenues will continue to grow at the rapid rate seen between 2020 and 2022, it is likely that tax revenue will continue to grow as the State of California's economy expands.

Table 6-8. Alternative 1: State of California Tax Revenue

Tax Revenue	2016 ($M)	2020 ($M)	2022 ($M)
Individual Income Tax	80,753	84,412	146,190
General Sales and Gross Receipts Tax	39,189	43,650	52,228

Source: Federal Reserve Bank of St. Louis, 2024

$M = millions of dollars

The City of Los Angeles has also experienced significant tax revenue growth during the previous decade. Table 5-5 includes property tax, sales tax, and general fund revenue for the City of Los Angeles for fiscal years (FY) 2016, 2020, and 2023. Property tax rose from $1,708 million in FY 2016 to $2,563 million in FY 2023, sales tax revenue rose from $438 million to $714 million over the same period, and the General Fund revenue for the City of Los Angeles rose from $4,893 million to $7,582 million.

Table 6-9. Alternative 1: City of Los Angeles Tax Revenue

Tax Revenue	2016 ($M)	FY 2020 ($M)	FY 2023 ($M)
Total Property Tax	1,708	2,261	2,563
Sales Tax	438	525	714
Total General Fund Revenue	4,893	7,009	7,582

Source: Controller's Office, City of Los Angeles, 2017, 2021, 2024

6.3 Environmental Impacts

Alternative 1 is expected to enhance economic development in the Los Angeles region by improving connectivity between the San Fernando Valley and the Westside of Los Angeles. This high-capacity rail transit alternative would provide efficient and reliable transportation for a large and growing travel market currently dependent on the congested Sepulveda Pass and nearby canyon roads.

One of the primary benefits of Alternative 1 would be the improved access it would provide to major employment, educational, and cultural centers in the greater Los Angeles area. By linking the Van Nuys Metrolink/Amtrak Station in the north with the Metro E Line in the south, Alternative 1 would facilitate smoother and faster commutes and reduce travel times compared to automobile travel along regularly congested I-405. This enhanced connectivity is expected to attract businesses and workers, which would foster a more dynamic and integrated regional economy. The convenience of rapid transit access would likely stimulate real estate development and boost property values along the Sepulveda Transit Corridor.

Throughout the construction period and the operations period, Alternative 1 is anticipated to increase employment for the region. Jobs would range from construction and engineering roles to ongoing operational and maintenance positions, which would provide a healthy boost to local employment. Additionally, Alternative 1 would contribute to the long-term resiliency of the City of Los Angeles. By diversifying transportation options and reducing reliance on automobiles, the region would be better positioned to withstand economic shocks related to fuel price volatility or disruptions in road networks and help reduce household transportation costs throughout the region.

6.3.1 Construction Output, Earnings, and Employment

Construction of Alternative 1 would require substantial capital investment in the Los Angeles Metropolitan Statistical Area (MSA). The necessary spending would increase the employment, earnings, and output for the duration of the construction period. Capital cost estimates are provided in 2023 dollars, providing a common value for expenditures that would be distributed over several years. The following section describes the Alternative 1 expenditures and anticipated economic effects.

Capital expenditures for Alternative 1 are estimated at $14,007 million (2023 dollars). The breakdown of capital expenditures by category is shown in Table 6-10. Capital expenditures exclude ROW costs because purchasing ROW is not anticipated to support job creation. Acquiring and selling a property is a transfer of asset between entities, and there is no economic activity associated with it, except for small real estate/bank fees.

Table 6-10. Alternative 1: Summary of Capital Costs

Category	2023 ($M)
Design and Planning	3,619
Construction	9,574
Equipment	814
Total	**14,007**

Source: Metro, 2024b

$M = millions of dollars
Note: Capital cost estimates are exclusive of right-of-way acquisition costs

To isolate the potential economic effects of the Alternative 1 alignment on the local economy and the State of California, it is typical to distinguish between resources/funds that are new to the economy — those that would be invested in the Los Angeles-Long Beach-Anaheim MSA and/or the State of California under Alternative 1 — and resources/funds that would be spent on projects in the region with similar economic effects (e.g., funds that would be allocated to other transportation construction projects in the area).

Two considerations determine the capital cost effects:

- Are the expenditures of the type likely to yield effects in the local economy?
- Are the funds used to make those expenditures new resources for the region?

At this stage of Alternative 1 development, the exact breakdown of funding distribution is subject to change. Alternative 1 is expected to be funded by a variety of local, state, and federal sources, including Measure M, which is a Los Angeles County voter-approved, no-sunset half-cent sales tax that funds projects to ease traffic, expand public transportation, and more (Metro, 2016). Measure M partially funds many Metro projects (Metro, 2016). For this analysis, 100 percent of Alternative 1 costs are treated as new funding to the region. This assumption yields an upper-limit estimate of economic output because of Alternative 1 construction. The actual effects from construction would likely be lower, after expenditures planned under the No Project Alternative, such as the Measure M funds, are removed. The Regional Input-Output Modeling System (RIMS II) analysis can be updated to reflect more accurate outputs after more detailed funding allocations become available. Equipment for Alternative 1 is expected to be sourced from outside the State of California. Therefore, the equipment cost category is not factored into the effect analysis.

Each dollar of new resources is expected to yield an economic effect. Table 6-11 provides the multiplier values for the industry categories by geographic area.

Table 6-11. Alternative 1: Comparison of Regional Input-Output Modeling System Multipliers for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Industry	Final Demand Multiplier			Direct Effect	
		Output ($)	Earnings ($)	Employment	Earnings ($)	Employment
Los Angeles-Long Beach-Anaheim MSA	Design and Planning	2.0752	0.7202	9.638	1.7681	2.2741
	Construction (Tunnel, Track and Approaches)	1.882	0.4868	7.1079	1.8935	2.1094
State of California	Design and Planning	2.1309	0.7867	10.6262	1.8193	2.3616
	Construction (Tunnel, Track and Approaches)	1.9668	0.5812	8.5522	1.8995	2.1325

Source: U.S. Bureau of Economic Analysis, 2024

$ = dollars

Using the construction industry as an example, the multipliers in Table 6-11 are interpreted as follows:

- The Final Demand Output Multiplier represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Employment Multiplier represents the total change in number of jobs that occurs in all industries for each $1 million of output delivered to final demand by the construction industry.
- The Direct Effect Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the construction industry.
- The Direct Effect Employment Multiplier represents the total change in number of jobs in all industries for each additional job in the construction industry.

Applying the Final Demand Multipliers for the construction industry to the amount of funding/resources allocated for capital expenditures provides estimates of the net output, earnings, and employment effects generated by Alternative 1 in each region. The results are summarized in Table 6-12 and Table 6-13. It is important to note that these effects are one-time effects lasting for the duration of Alternative 1 construction. One job is defined as a job for one person with a duration of one year. For example, a job for one person lasting three years would be defined as three person-year jobs.

It is noteworthy that the economic effects at the MSA level and at the state level are not additive. The economic effects at the MSA level assume that the Alternative 1 costs, with the exception of vehicle costs that were removed, would be incurred entirely in the Los Angeles-Long Beach-Anaheim MSA. Likewise, the economic effects at the state level assume that the Alternative 1 costs, also with the exception of vehicle costs, would be incurred entirely in the State of California. As previously discussed in Section 3.2.1.4, this is a high estimate because 100 percent of funding is assumed to be new to the region. Similarly, the State of California outputs assume that all Alternative 1 costs would be new funding within the state. Table 6-12 and Table 6-13 outline two separate scenarios and illustrate the maximum economic benefits achievable from each one. For example, Alternative 1 would not generate

99,700 person-years of employment within the MSA (Table 6-12) and 116,600 within the State of California (Table 6-13) simultaneously; these two values should be considered individually.

Table 6-12. Alternative 1: Net Effects of Capital Expenditure on the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Year Jobs)
Design and Planning	3,619	2.0752	0.7202	9.638	7,509	2,606	33,802
Construction (Tunnel, Track and Approaches)	9,574	1.882	0.4868	7.1079	18,019	4,661	65,960
Total	**13,193**				**25,528**	**7,267**	**99,762**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the Los Angeles-Long Beach-Anaheim MSA, the construction spending for Alternative 1 is expected to generate $18,019 million in output (in 2023 dollars), $4,661 million in earnings, and over 65,900 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $7,509 million, earnings of $2,606 million, and employment of over 33,800 person-year jobs.

Table 6-13. Alternative 1: Net Effects of Capital Expenditure on the State of California

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-year jobs)
Design and Planning	3,619	2.1309	0.7867	10.6262	7,711	2,847	37,267
Construction (Tunnel, Track and Approaches)	9,574	1.9668	0.5812	8.5522	18,831	5,565	79,363
Total	**13,193**				**26,542**	**8,411**	**116,630**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the State of California, the construction spending for Alternative 1 is expected to generate $18,831 million in output (in 2023 dollars), $5,565 million in earnings, and over 79,300 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $7,711 million, earnings of $2,847 million, and employment of over 37,200 person-year jobs.

6.3.2 Operational Output, Earnings, and Employment

Alternative 1 is expected to generate reoccurring employment and earnings for the region in the form of operation and maintenance staff, facility operators, and maintenance expenditures. The operations and maintenance (O&M) expenditures for Alternative 1 are expected to have a beneficial, but not substantial effect on local employment, relative to the overall employment of the region.

6.3.3 Fiscal Effects

The wages generated from Alternative 1 would boost tax revenues at the state and county levels. The middle-income tax bracket rate of 9.3 percent was chosen for the analysis, because it covers the widest

range of middle-income households — those with an annual income between $68,350 and $349,137 — as shown in Table 6-14. Due to possible spillage into other income tax brackets and accounting for the limitations of this methodology, the final income and sales tax revenue generated from Alternative 1 should be considered estimates. The 9.3 percent assumed tax rate is an upper limit estimate. The effective tax rate would be lower than 9.3 percent due to the first $68,350 of household income being taxed at the lower tax bracket. Sales tax rates for the State of California and Los Angeles County are provided in Table 6-15.

Table 6-14. Alternative 1: State of California Income Tax Rates

Income Bracket	Income Tax Rate
$0 - $10,412	1.00%
$10,412 - $24,684	2.00%
$24,684 - $38,959	4.00%
$38,959 - $54,081	6.00%
$54,081 - $68,350	8.00%
$68,350 - $349,137	9.30%
$349,137 - $418,961	10.30%
$418,961 - $698,271	11.30%
> $698,271	12.30%

Source: California Franchise Tax Board, 2023

Table 6-15. Alternative 1: Sales Tax Rates for the State of California and Los Angeles County

Region	Sales Tax Rate
State of California	7.25%
Los Angeles County	9.50%

Source: California Department of Tax and Fee Administration, 2024

6.3.3.1 Income Tax Revenue

To calculate the additional income tax earnings for the State of California, the income tax rate of 9.3 percent was used. the Los Angeles-Long Beach-Anaheim MSA, the average income tax rate for the area was applied to the earnings generated within the MSA.

Table 6-16 shows the additional income tax generated to the MSA and State of California under Alternative 1. The Los Angeles-Long Beach-Anaheim MSA would generate additional income tax revenue of $676 million. The State of California would generate additional income tax revenue of $782 million. As discussed earlier in Section 6.3.1, these increases in tax revenue would not be additive and should be considered as two separate scenarios.

Table 6-16. Alternative 1: Additional Income Tax Generated Earnings for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings (2023 $M)	Income Tax Generated (2023 $M)
Los Angeles–Long Beach–Anaheim MSA	7,267	676
State of California	8,411	782

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

6.3.3.2 Sales Tax Revenue

The incremental consumption from new earnings would also boost sale tax revenues for the MSA and state. To estimate the potential increase in sales tax, calculations should account for the portion of consumption subject to sales tax and income tax deductions, as follows:

- Consumption expenditure subject to sales tax requires the identification of the share of the consumption basket that is taxable. The categories included in the analysis represent the typical expenditure for a household in the State of California. Taxable expenditures include food away from home, alcoholic beverages, apparel and services, transportation, entertainment, and personal care products (Table 6-17). For the State of California, around 29 percent of consumption expenditures are subject to sales tax (U.S. Bureau of Labor Statistics, 2020). The 29 percent value is applied to both the MSA and State of California earnings to generate the expected sales tax revenue increase. A breakdown of California household annual taxable expenditures is available in Table 6-17. Household expenditures are based on the U.S. Bureau of Labor Statistics calculated average of 2.7 individuals per California household.
- After-tax earnings exclude income tax from gross earnings, as identified in Table 6-18.

Table 6-17. Alternative 1: Average Household Annual Taxable Expenditures in the State of California, 2019-2020

Category	Expenditure Means
Food away from home	$3,596.47
Alcoholic beverages	$666.20
Apparel and services	$1,738.69
Transportation	$10,499.82
Entertainment	$3,134.81
Personal care products	$813.00
Total	**$20,448.99**
Average annual expenditures	$70,830.25
Annual expenditures subject to sales tax	**29%**

Source: U.S. Bureau of Labor Statistics, 2020

Table 6-18 provides the additional sales tax generated from the MSA and State of California under Alternative 1. The MSA and State of California would generate sales tax earnings of $182 million and $160 million, respectively. As discussed earlier in Section 6.3.1, these increases in tax revenue would not be additive and should be considered as two separate scenarios.

Table 6-18. Alternative 1: Sales Tax Revenues Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings after Income Tax Deductions (2023 $M)[a]	Taxable Consumption Expenditure (2023 $M)[b]	Sales Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	6,591	1,911	182
State of California	7,629	2,212	160

Source: BEA, 2024; Metro, 2024b

[a]This is equal to the total consumption expenditure.
[b]Figured at 29 percent of total consumption expenditure.

2023 $M = millions in 2023 dollars

6.3.3.3 Property Tax Revenue

To construct Alternative 1, it would be necessary to acquire private land and structures for easements, ROWs, parking, and station facilities. These acquisitions would remove the properties from the local tax base, which would reduce annual tax revenue.

Including temporary takes during construction and applying a conservative assumption that both partial and full takes would result in property tax loss for the full parcel, it is estimated that less than 0.13 percent of the Los Angeles County or City of Los Angeles annual property tax revenue would be impacted relative to 2023 assessed parcel values and the total 2023 property tax revenues (County of Los Angeles, 2023; Controller's Office, City of Los Angeles, 2024). The calculated revenue loss would be well below the annual change in levied taxes, which increased 5.5 percent in fiscal year 2022-2023 from fiscal year 2022-2023 (County of Los Angeles, 2023). The projected loss in tax revenues associated with Alternative 1 would not compromise the County's or City's ability to provide services or generate an adverse effect.

Additionally, proximity to public transit can increase property values in both residential and commercial real estate markets (APTA, 2019), potentially offsetting property tax loss from parcel acquisition. For example, between 2012 and 2016, residential property values near transit areas increased by 61 percent, 8 percentage points more than in non-transit areas. Commercial properties near transit performed better than other commercial properties in the region, with a 73 percent increase in property value in the transit areas versus 58 percent in the region.

6.4 Mitigation Measures

6.4.1 Construction Effects

Table 6-19 shows the additional annual employment generated in the short term would be 0.24 percent of existing employment in the Los Angeles-Long Beach-Anaheim MSA and 0.1 percent of existing employment in the State of California. Additionally, the employment generated as a result of Alternative 1 would be distributed throughout the construction life of Alternative 1. The over 99,700 person-year jobs would not occur within the same year, smoothing the effects of employment related to Alternative 1 further. Assuming a 6½ year construction timeline for Alternative 1, the alternative is projected to generate an additional 15,300 jobs annually within the MSA. Additional employment generated from Alternative 1 would be a relatively small increase in overall employment and would have beneficial effects on the local economy. Therefore, no mitigation measures are required.

Table 6-19. Alternative 1: Employment Effects Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Short-Term Employment Generated (Person-Year Jobs)	Jobs Created Annually (6½ year construction schedule)	Existing Employment[a] (2024)	Short-Term Employment Generated Annually[b]
Los Angeles-Long Beach-Anaheim MSA	99,762	15,348	6,346,100	0.24%
State of California	116,630	17,943	18,104,800	0.10%

Source: U.S. Bureau of Labor Statistics, 2025a, 2025b

[a]October 2024 Total Nonfarm, Not Seasonally Adjusted
[b]Jobs Created Annually/Employment

6.4.2 Operational Effects

Annual O&M costs would be a fraction of the construction costs, which would require no mitigation measures. Therefore, there will also be no mitigation measures required for operational effects.

6.4.3 Impacts After Mitigation

No mitigation measures are required; impacts are less than significant.

7 ALTERNATIVE 3

7.1 Alternative Description

Alternative 3 is an aerial monorail alignment that would run along the Interstate 405 (I-405) corridor and would include seven aerial monorail transit (MRT) stations and an underground tunnel alignment between the Getty Center and Wilshire Boulevard with two underground stations. This alternative would provide transfers to five high-frequency fixed guideway transit and commuter rail lines, including the Los Angeles County Metropolitan Transportation Authority's (Metro) E, Metro D, and Metro G Lines, the East San Fernando Valley Light Rail Transit Line, and the Metrolink Ventura County Line. The length of the alignment between the terminus stations would be approximately 16.1 miles, with 12.5 miles of aerial guideway and 3.6 miles of underground configuration.

The seven aerial and two underground MRT stations would be as follows:

1. Metro E Line Expo/Sepulveda Station (aerial)
2. Santa Monica Boulevard Station (aerial)
3. Wilshire Boulevard/Metro D Line Station (underground)
4. UCLA Gateway Plaza Station (underground)
5. Getty Center Station (aerial)
6. Ventura Boulevard/Sepulveda Boulevard Station (aerial)
7. Metro G Line Sepulveda Station (aerial)
8. Sherman Way Station (aerial)
9. Van Nuys Metrolink Station (aerial)

7.1.1 Operating Characteristics

7.1.1.1 Alignment

As shown on Figure 7-1, from its southern terminus at the Metro E Line Expo/Sepulveda Station, the alignment of Alternative 3 would generally follow I-405 to the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor, except for an underground segment between Wilshire Boulevard and the Getty Center.

The proposed southern terminus station would be located west of the existing Metro E Line Expo/Sepulveda Station, east of I-405 between Pico Boulevard and Exposition Boulevard. Tail tracks would extend just south of the station adjacent to the eastbound Interstate 10 to northbound I-405 connector over Exposition Boulevard. North of the Metro E Line Expo/Sepulveda Station, a storage track would be located off the main alignment north of Pico Boulevard between I-405 and Cotner Avenue. The alignment would continue north along the east side of I-405 until just south of Santa Monica Boulevard, where a proposed station would be located between the I-405 northbound travel lanes and Cotner Avenue. The alignment would cross over the northbound and southbound freeway lanes north of Santa Monica Boulevard and travel along the west side of I-405. Once adjacent to the U.S. Department of Veterans Affairs (VA) Hospital site, the alignment would cross back over the I-405 lanes and Sepulveda Boulevard, before entering an underground tunnel south of the Federal Building parking lot.

Figure 7-1. Alternative 3: Alignment

Source: LASRE, 2024; HTA, 2024

The alignment would proceed east underground and turn north under Veteran Avenue toward the proposed Wilshire Boulevard/Metro D Line Station located under the University of California, Los Angeles (UCLA) Lot 36 on the east side of Veteran Avenue north of Wilshire Boulevard. North of this station, the underground alignment would curve northeast parallel to Weyburn Avenue before curving north and traveling underneath Westwood Plaza at Le Conte Avenue. The alignment would follow Westwood Plaza until the underground UCLA Gateway Plaza Station in front of the Luskin Conference

Center. The alignment would then continue north under the UCLA campus until Sunset Boulevard, where the tunnel would curve northwest for approximately 2 miles to rejoin I-405.

The Alternative 3 alignment would transition from an underground configuration to an aerial guideway structure after exiting the tunnel portal located at the northern end of the Leo Baeck Temple parking lot. The alignment would cross over Sepulveda Boulevard and the I-405 lanes to the proposed Getty Center Station on the west side of I-405, just north of the Getty Center tram station. The alignment would return to the median for a short distance before curving back to the west side of I-405 south of the Sepulveda Boulevard undercrossing north of the Getty Center Drive interchange. After crossing over Bel Air Crest Road and Skirball Center Drive, the alignment would again return to the median and run under the Mulholland Drive Bridge, then continue north within the I-405 median to descend into the San Fernando Valley (Valley).

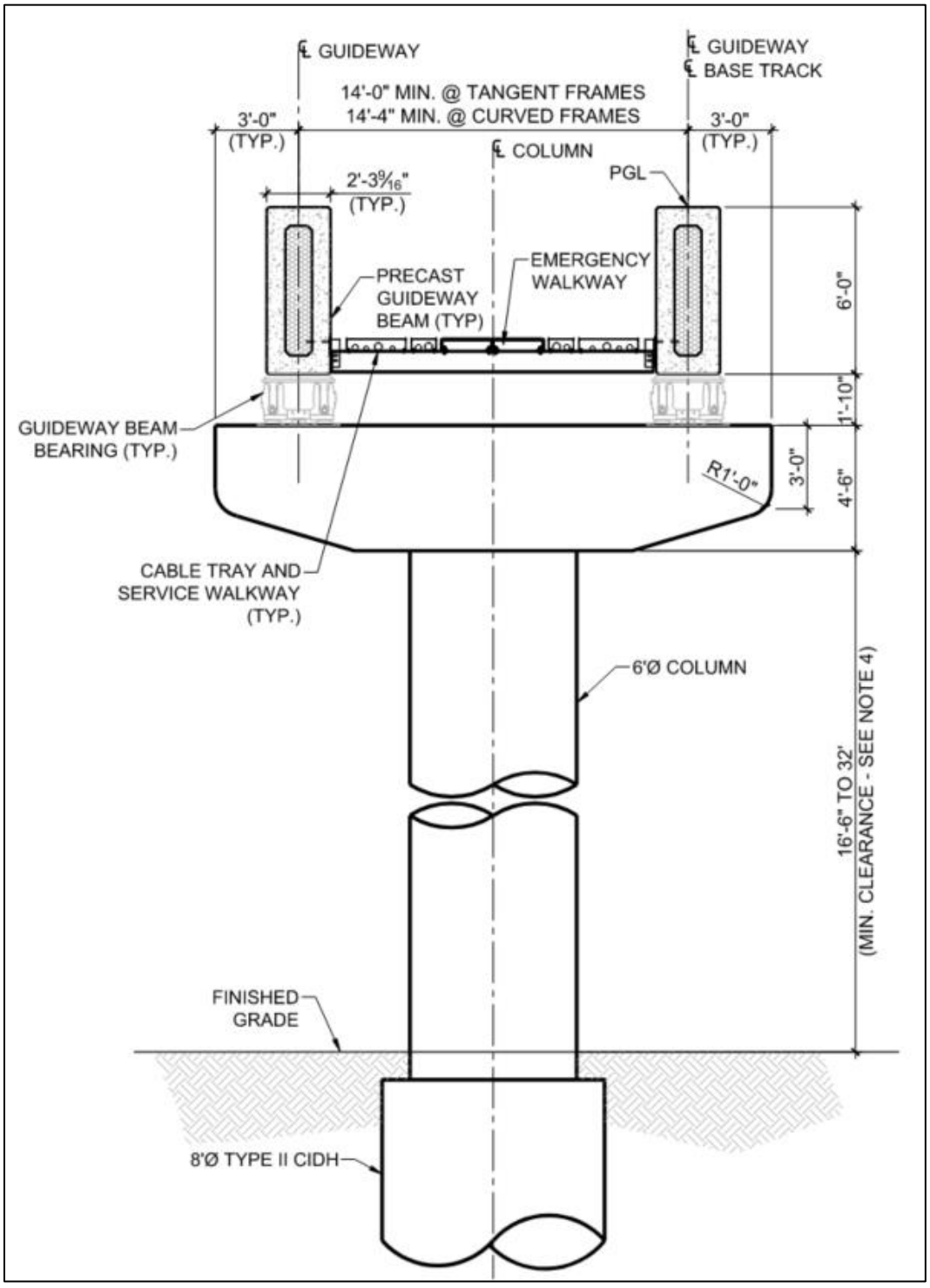
Near Greenleaf Street, the alignment would cross over the northbound freeway lanes and on-ramps toward the proposed Ventura Boulevard Station on the east side of I-405. This station would be located above a transit plaza and replace an existing segment of Dickens Street adjacent to I-405, just south of Ventura Boulevard. Immediately north of the Ventura Boulevard Station, the alignment would cross over the northbound I-405 to U.S. Highway 101 (US-101) connector and continue north between the connector and the I-405 northbound travel lanes. The alignment would continue north along the east side of I-405 — crossing over US-101 and the Los Angeles River — to a proposed station on the east side of I-405 near the Metro G Line Busway. A new at-grade station on the Metro G Line would be constructed for Alternative 3 adjacent to the proposed station. These proposed stations are shown on the Metro G Line inset area on Figure 7-1.

The alignment would then continue north along the east side of I-405 to the proposed Sherman Way Station. The station would be located inside the I-405 northbound loop off-ramp to Sherman Way. North of the station, the alignment would continue along the eastern edge of I-405, then curve to the southeast parallel to the LOSSAN rail corridor. The alignment would run elevated along Raymer Street east of Sepulveda Boulevard and cross over Van Nuys Boulevard to the proposed terminus station adjacent to the Van Nuys Metrolink/Amtrak Station. Overhead utilities along Raymer Street would be undergrounded where they would conflict with the guideway or its supporting columns. Tail tracks would be located southeast of this terminus station.

7.1.1.2 Guideway Characteristics

Alternative 3 would utilize straddle-beam monorail technology, which allows the monorail vehicle to straddle a guide beam that both supports and guides the vehicle. Alternative 3 would operate on aerial and underground guideways with dual-beam configurations. Northbound and southbound trains would travel on parallel beams either in the same tunnel or supported by a single-column or straddle-bent aerial structure. Figure 7-2 shows a typical cross-section of the aerial monorail guideway.

Figure 7-2. Typical Aerial Monorail Guideway Cross-Section



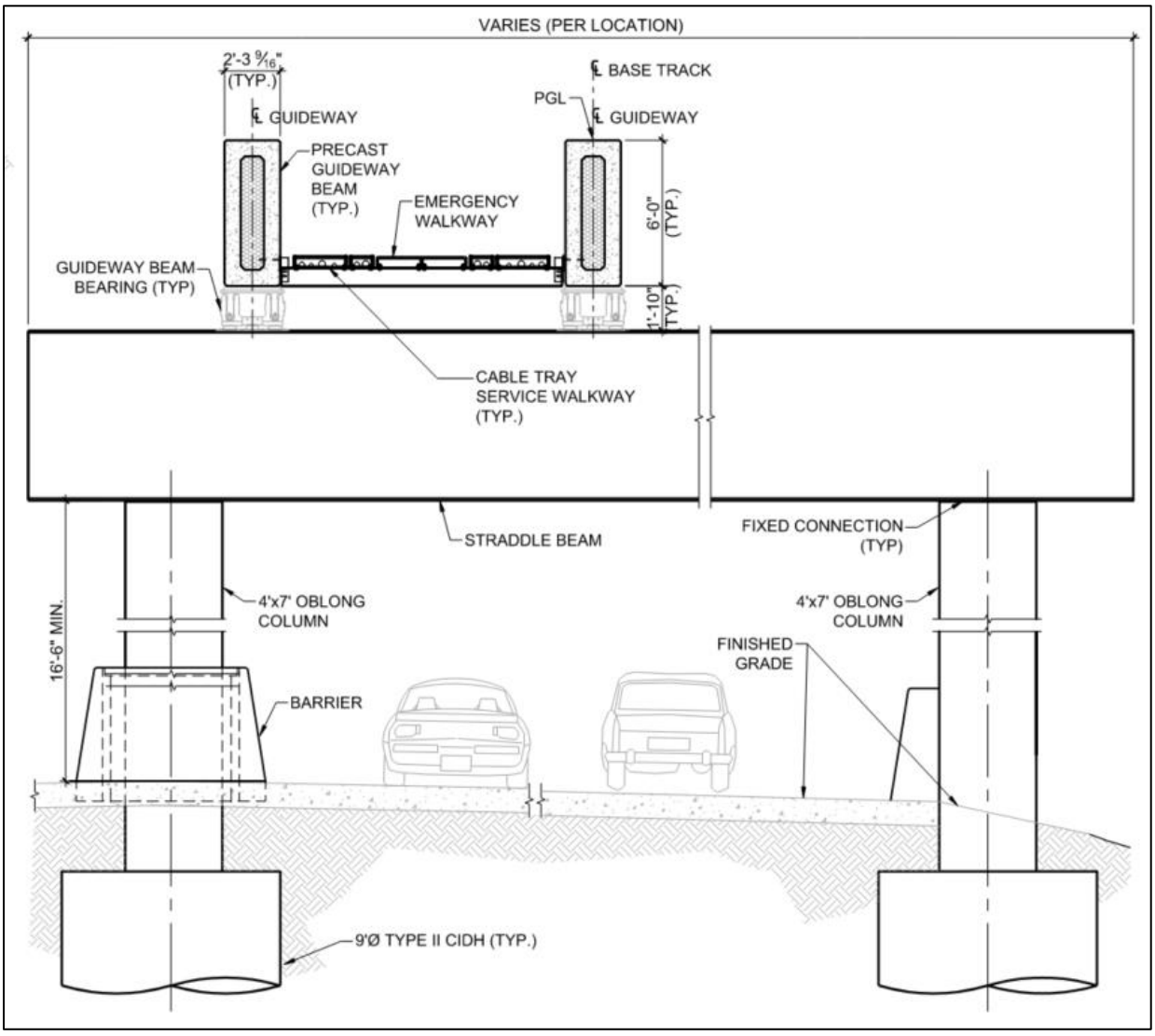
Source: LASRE, 2024

On a typical guideway section (i.e., not at a station), guide beams would rest on 20-foot-wide column caps (i.e., the structure connecting the columns and the guide beams), with typical spans (i.e., the

distance between columns) ranging from 70 to 190 feet. The bottom of the column caps would typically be between 16.5 feet and 32 feet above ground level.

Over certain segments of roadway and freeway facilities, a straddle-bent configuration, as shown on Figure 7-3, consisting of two concrete columns constructed outside of the underlying roadway would be used to support the guide beams and column cap. Typical spans for these structures would range between 65 and 70 feet. A minimum 16.5-foot clearance would be maintained between the underlying roadway and the bottom of the column caps.

Figure 7-3. Typical Monorail Straddle-Bent Cross-Section



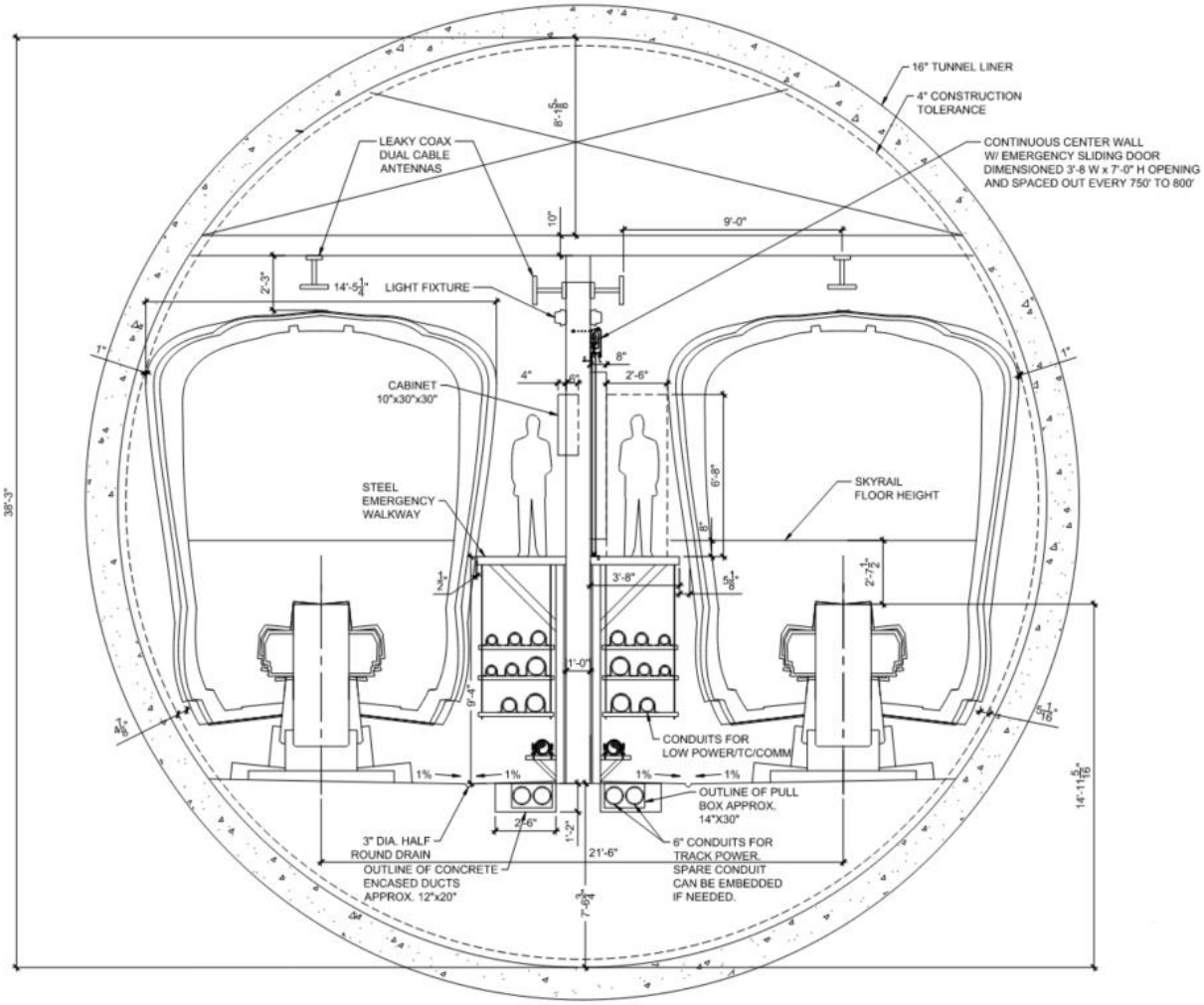
Source: LASRE, 2024

Structural support columns would vary in size and arrangement by alignment location. Columns would be 6 feet in diameter along main alignment segments adjacent to I-405 and be 4 feet wide by 6 feet long in the I-405 median. Straddle-bent columns would be 4 feet wide by 7 feet long. At stations, six rows of dual 5-foot by 8-foot columns would support the aerial guideway. Beam switch locations and long-span structures would also utilize different sized columns, with dual 5-foot columns supporting switch

locations and either 9-foot or 10-foot-diameter columns supporting long-span structures. Crash protection barriers would be used to protect the columns. All columns would have a cast-in-drilled-hole (CIDH) pile foundation extending 1 foot in diameter beyond the column width with varying depths for appropriate geotechnical considerations and structural support.

For underground sections, a single 40-foot-diameter tunnel would be needed to accommodate dual-beam configuration. The tunnel would be divided by a 1-foot-thick center wall dividing two compartments with a 14.5-foot-wide space for trains and a 4-foot-wide emergency evacuation walkway. The center wall would include emergency sliding doors placed every 750 to 800 feet. A plenum within the crown of the tunnel, measuring 8 feet tall from the top of the tunnel, would allow for air circulation and ventilation. Figure 7-4 illustrates these components at a typical cross-section of the underground monorail guideway.

Figure 7-4. Typical Underground Monorail Guideway Cross-Section



Source: LASRE, 2024

7.1.1.3 Vehicle Technology

Alternative 3 would utilize straddle-beam monorail technology, which allows the monorail vehicle to straddle a guide beam that both supports and guides the vehicle. Rubber tires would sit both atop and

on each side of the guide beam to provide traction and guide the train. Trains would be automated and powered by power rails mounted to the guide beam, with planned peak-period headways of 166 seconds and off-peak-period headways of 5 minutes. Monorail trains could consist of up to eight cars. Alternative 3 would have a maximum operating speed of 56 miles per hour; actual operating speeds would depend on the design of the guideway and distance between stations.

Monorail train cars would be 10.5 feet wide, with two double doors on each side. End cars would be 46.1 feet long with a design capacity of 97 passengers, and intermediate cars would be 35.8 feet long and have a design capacity of 90 passengers.

7.1.1.4 Stations

Alternative 3 would include seven aerial and two underground MRT stations with platforms approximately 320 feet long. Aerial stations would be elevated 50 feet to 75 feet above the ground level, and underground stations would be 80 feet to 110 feet underneath the existing ground level. The Metro E Line Expo/Sepulveda, Santa Monica Boulevard, Ventura Boulevard/Sepulveda Boulevard, Sherman Way, and Van Nuys Metrolink Stations would be center-platform stations where passengers would travel up to a shared platform that would serve both directions of travel. The Wilshire Boulevard/Metro D Line, UCLA Gateway Plaza, Getty Center, and Metro G Line Sepulveda Stations would be side-platform stations where passengers would select and travel up or down to station platforms depending on their direction of travel. Each station, regardless of whether it has side or center platforms, would include a concourse level prior to reaching the train platforms. Each station would have a minimum of two elevators, two escalators, and one stairway from ground level to the concourse.

Aerial station platforms would be approximately 320 feet long and would be supported by six rows of dual 5-foot by 8-foot columns. The platforms would be covered, but not enclosed. Side-platform stations would be 61.5 feet wide to accommodate two 13-foot-wide station platforms with a 35.5-foot-wide intermediate gap for side-by-side trains. Center-platform stations would be 49 feet wide, with a 25-foot-wide center platform.

Underground side platforms would be 320 feet long and 26 feet wide, separated by 31.5 feet for side-by-side trains.

Monorail stations would include automatic, bi-parting fixed doors along the edges of station platforms. These doors would be integrated into the automatic train control system and would not open unless a train is stopped at the platform.

The following information describes each station, with relevant entrance, walkway, and transfer information. Bicycle parking would be provided at each station.

Metro E Line Expo/Sepulveda Station

- This aerial station would be located near the existing Metro E Line Expo/Sepulveda Station, just east of I-405 between Pico Boulevard and Exposition Boulevard.
- A transit plaza and station entrance would be located on the east side of the station.
- An off-street passenger pick-up/drop-off loop would be located south of Pico Boulevard west of Cotner Avenue.
- An elevated pedestrian walkway would connect the concourse level of the proposed station to the Metro E Line Expo/Sepulveda Station within the fare paid zone.

- Passengers would be able to park at the existing Metro E Line Expo/Sepulveda Station parking facility, which provides 260 parking spaces. No additional automobile parking would be provided at the proposed station.

Santa Monica Boulevard Station

- This aerial station would be located just south of Santa Monica Boulevard, between the I-405 northbound travel lanes and Cotner Avenue.
- Station entrances would be located on the southeast and southwest corners of Santa Monica Boulevard and Cotner Avenue. The entrance on the southeast corner of the intersection would be connected to the station concourse level via an elevated pedestrian walkway spanning Cotner Avenue.
- No dedicated station parking would be provided at this station.

Wilshire Boulevard/Metro D Line Station

- This underground station would be located under UCLA Lot 36 on the east side of Veteran Avenue north of Wilshire Boulevard.
- A station entrance would be located on the northeast corner of the intersection of Veteran Avenue and Wilshire Boulevard.
- An underground pedestrian walkway would connect the concourse level of the proposed station to the Metro D Line Westwood/UCLA Station using a knock-out panel provided in the Metro D Line Station box. This connection would occur within the fare paid zone.
- No dedicated station parking would be provided at this station.

UCLA Gateway Plaza Station

- This underground station would be located beneath Gateway Plaza.
- Station entrances would be located on the northern end and southeastern end of the plaza.
- No dedicated station parking would be provided at this station.

Getty Center Station

- This aerial station would be located on the west side of I-405 near the Getty Center, approximately 1,000 feet north of the Getty Center tram station.
- An elevated pedestrian walkway would connect the proposed station's concourse level with the Getty Center tram station. The proposed connection would occur outside the fare paid zone.
- An entrance to the walkway above the Getty Center's parking lot would be the proposed station's only entrance.
- No dedicated station parking would be provided at this station.

Ventura Boulevard/Sepulveda Boulevard Station

- This aerial station would be located east of I-405, just south of Ventura Boulevard.
- A transit plaza, including two station entrances, would be located on the east side of the station. The plaza would require the closure of a 0.1-mile segment of Dickens Street between Sepulveda

Boulevard and Ventura Boulevard, with a passenger pick-up/drop-off loop and bus stops provided south of the station, off Sepulveda Boulevard.

- No dedicated station parking would be provided at this station.

Metro G Line Sepulveda Station

- This aerial station would be located near the Metro G Line Sepulveda Station, between I-405 and the Metro G Line Busway.
- Entrances to the MRT station would be located on both sides of the new proposed Metro G Line bus rapid transit (BRT) station.
- An elevated pedestrian walkway would connect the concourse level of the proposed station to the proposed new Metro G Line BRT station outside of the fare paid zone.
- Passengers would be able to park at the existing Metro G Line Sepulveda Station parking facility, which has a capacity of 1,205 parking spaces. Currently, only 260 parking spaces are used for transit parking. No additional automobile parking would be provided at the proposed station.

Sherman Way Station

- This aerial station would be located inside the I-405 northbound loop off-ramp to Sherman Way.
- A station entrance would be located on the north side of Sherman Way, directly across the street from the I-405 northbound off-ramp to Sherman Way East.
- An on-street passenger pick-up/drop-off area would be provided on the north side of Sherman Way west of Firmament Avenue.
- No dedicated station parking would be provided at this station.

Van Nuys Metrolink Station

- This aerial station would be located on the east side of Van Nuys Boulevard, just south of the LOSSAN rail corridor, incorporating the site of the current Amtrak ticket office.
- A station entrance would be located on the east side of Van Nuys Boulevard just south of the LOSSAN rail corridor. A second entrance would be located to the north of the LOSSAN rail corridor with an elevated pedestrian walkway connecting to both the concourse level of the proposed station and the platform of the Van Nuys Metrolink/Amtrak Station.
- Existing Metrolink Station parking would be reconfigured, maintaining approximately the same number of spaces, but 180 parking spaces would be relocated north of the LOSSAN rail corridor. Metrolink parking would not be available to Metro transit riders.

7.1.1.5 Station-to-Station Travel Times

Table 7-1 presents the station-to-station distance and travel times for Alternative 3. The travel times include both running time and dwelling time. The travel times differ between northbound and southbound trips because of grade differentials and operational considerations at end-of-line stations.

Table 7-1. Alternative 3: Station-to-Station Travel Times and Station Dwell Times

From Station	To Station	Distance (miles)	Northbound Station-to-Station Travel Time (seconds)	Southbound Station-to-Station Travel Time (seconds)	Dwell Time (seconds)
Metro E Line Station					*30*
Metro E Line	Santa Monica Boulevard	0.9	123	97	—
Santa Monica Boulevard Station					*30*
Santa Monica Boulevard	Wilshire/Metro D Line	1.1	192	194	—
Wilshire/Metro D Line Station					*30*
Wilshire/Metro D Line	UCLA Gateway Plaza	0.9	138	133	—
UCLA Gateway Plaza Station					*30*
UCLA Gateway Plaza	Getty Center	2.6	295	284	—
Getty Center Station					*30*
Getty Center	Ventura Boulevard	4.7	414	424	—
Ventura Boulevard Station					*30*
Ventura Boulevard	Metro G Line	2.0	179	187	—
Metro G Line Station					*30*
Metro G Line	Sherman Way	1.5	134	133	—
Sherman Way Station					*30*
Sherman Way	Van Nuys Metrolink	2.4	284	279	—
Van Nuys Metrolink Station					*30*

Source: LASRE, 2024

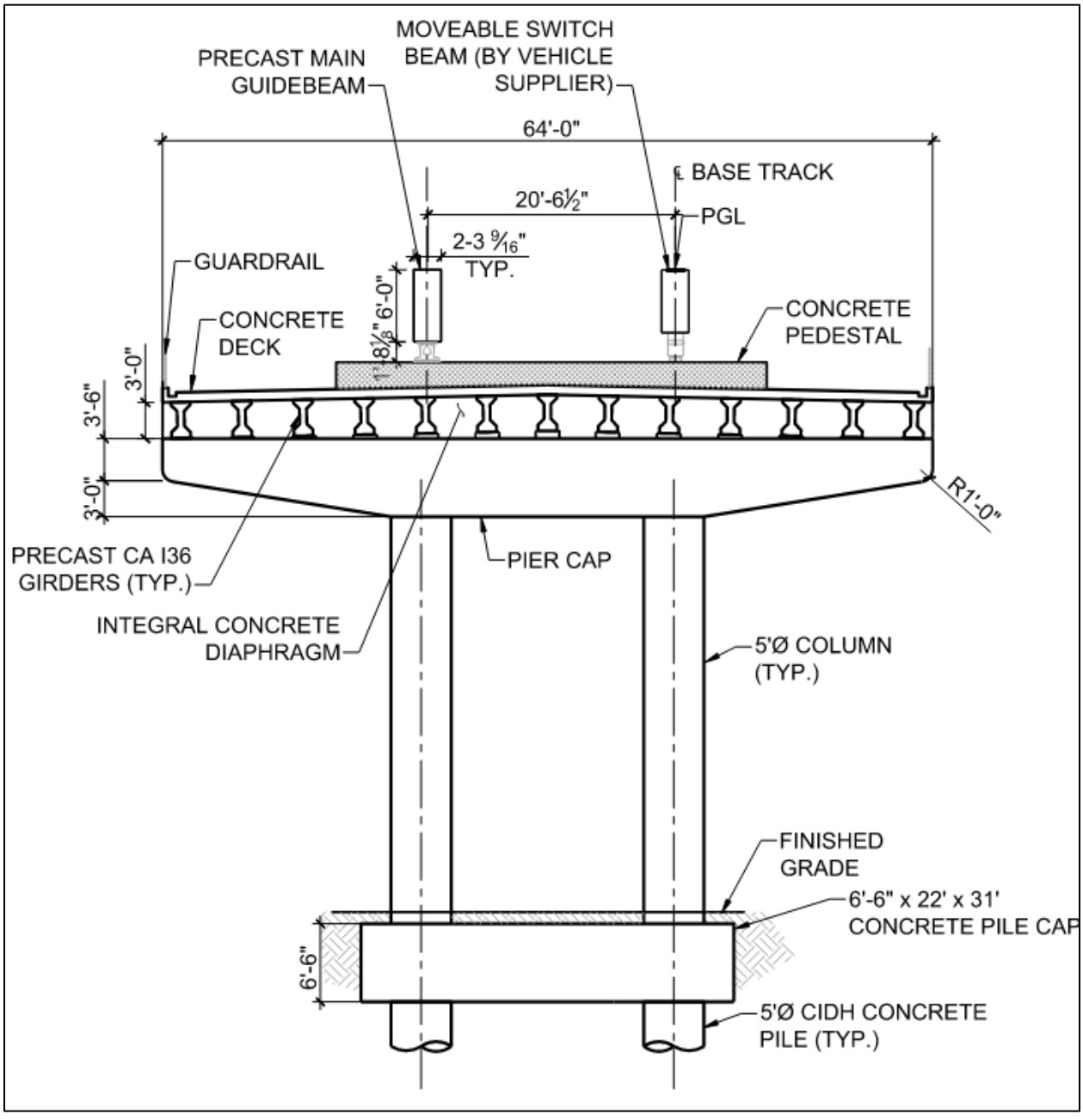
— = no data

7.1.1.6 Special Trackwork

Alternative 3 would include five pairs of beam switches to enable trains to cross over and reverse direction on the opposite beam. All beam switches would be located on aerial portions of the alignment of Alternative 3. From south to north, the first pair of beam switches would be located just north of the Metro E Line Expo/Sepulveda Station. A second pair of beam switches would be located on the west side of I-405, directly adjacent to the VA Hospital site, south of the Wilshire Boulevard/Metro D Line Station. A third pair of beam switches would be located in the Sepulveda Pass just south of Mountaingate Drive and Sepulveda Boulevard. A fourth pair of beam switches would be located south of the Metro G Line Station between the I-405 northbound lanes and the Metro G Line Busway. The final pair would be located near the Van Nuys Metrolink Station.

At beam switch locations, the typical cross-section of the guideway would increase in column and column cap width. The column cap width at these locations would be 64 feet, with dual 5-foot-diameter columns. Underground pile caps for additional structural support would also be required at these locations. Figure 7-5 shows a typical cross-section of the monorail beam switch.

Figure 7-5. Typical Monorail Beam Switch Cross-Section



Source: LASRE, 2024

7.1.1.7 Maintenance and Storage Facility

MSF Base Design

In the maintenance and storage facility (MSF) Base Design for Alternative 3, the MSF would be located on City of Los Angeles Department of Water and Power (LADWP) property east of the Van Nuys Metrolink Station. The MSF Base Design site would be approximately 18 acres and would be designed to accommodate a fleet of 208 monorail vehicles. The site would be bounded by the LOSSAN rail corridor

to the north, Saticoy Street to the south, and property lines extending north of Tyrone and Hazeltine Avenues to the east and west, respectively.

Monorail trains would access the site from the main alignment's northern tail tracks at the northwest corner of the site. Trains would travel parallel to the LOSSAN rail corridor before curving southeast to maintenance facilities and storage tracks. The guideway would remain in an aerial configuration within the MSF Base Design, including within maintenance facilities.

The site would include the following facilities:

- Primary entrance with guard shack
- Primary maintenance building that would include administrative offices, an operations control center, and a maintenance shop and office
- Train car wash building
- Emergency generator
- Traction power substation (TPSS)
- Maintenance-of-way (MOW) building
- Parking area for employees

MSF Design Option 1

In the MSF Design Option 1, the MSF would be located on industrial property, abutting Orion Avenue, south of the LOSSAN rail corridor. The MSF Design Option 1 site would be approximately 26 acres and would be designed to accommodate a fleet of 224 monorail vehicles. The site would be bounded by I-405 to the west, Stagg Street to the south, the LOSSAN rail corridor to the north, and Orion Avenue and Raymer Street to the east. The monorail guideway would travel along the northern edge of the site.

Monorail trains would access the site from the monorail guideway east of Sepulveda Boulevard, requiring additional property east of Sepulveda Boulevard and north of Raymer Street. From the northeast corner of the site, trains would travel parallel to the LOSSAN rail corridor before turning south to maintenance facilities and storage tracks parallel to I-405. The guideway would remain in an aerial configuration within the MSF Design Option 1, including within maintenance facilities.

The site would include the following facilities:

- Primary entrance with guard shack
- Primary maintenance building that would include administrative offices, an operations control center, and a maintenance shop and office
- Train car wash building
- Emergency generator
- TPSS
- MOW building
- Parking area for employees

Figure 7-6 shows the locations of the MSF Base Design and MSF Design Option 1 for Alternative 3.

Figure 7-6. Alternative 3: Maintenance and Storage Facility Options

Source: LASRE, 2024; HTA, 2024

7.1.1.8 Traction Power Substations

TPSSs transform and convert high voltage alternating current supplied from power utility feeders into direct current suitable for transit operation. A TPSS on a site of approximately 8,000 square feet would be located approximately every 1 mile along the alignment. Table 7-2 lists the TPSS locations proposed for Alternative 3.

Figure 7-7 shows the TPSS locations along the Alternative 3 alignment.

Table 7-2. Alternative 3: Traction Power Substation Locations

TPSS No.	TPSS Location Description	Configuration
1	TPSS 1 would be located east of I-405, just south of Exposition Boulevard and the monorail guideway tail tracks.	At-grade
2	TPSS 2 would be located east of I-405 and Sepulveda Boulevard, just north of the Getty Center Station.	At-grade
3	TPSS 3 would be located west of I-405, just east of the intersection between Promontory Road and Sepulveda Boulevard.	At-grade
4	TPSS 4 would be located between I-405 and Sepulveda Boulevard, just north of the Skirball Center Drive Overpass.	At-grade
5	TPSS 5 would be located east of I-405, just south of Ventura Boulevard Station, between Sepulveda Boulevard and Dickens Street.	At-grade
6	TPSS 6 would be located east of I-405, just south of the Metro G Line Sepulveda Station.	At-grade
7	TPSS 7 would be located east of I-405, just east of the Sherman Way Station, inside the I-405 Northbound Loop Off-Ramp to Sherman Way westbound.	At-grade
8	TPSS 8 would be located east of I-405, at the southeast quadrant of the I-405 overcrossing with the LOSSAN rail corridor.	At-grade
9	TPSS 9 would be located east of I-405, at the southeast quadrant of the I-405 overcrossing with the LOSSAN rail corridor.	At-grade (within MSF Design Option)
10	TPSS 10 would be located between Van Nuys Boulevard and Raymer Street, south of the LOSSAN rail corridor.	At-grade
11	TPSS 11 would be located south of the LOSSAN rail corridor, between Tyrone Avenue and Hazeltine Avenue.	At-grade (within MSF Base Design)
12	TPSS 12 would be located southwest of Veteran Avenue at Wellworth Avenue.	Underground
13	TPSS 13 would be located within the Wilshire Boulevard/Metro D Line Station.	Underground (adjacent to station)
14	TPSS 14 would be located underneath UCLA Gateway Plaza.	Underground (adjacent to station)

Source: LASRE, 2024; HTA, 2024

Figure 7-7. Alternative 3: Traction Power Substation Locations

Source: LASRE, 2024; HTA, 2024

7.1.1.9 Roadway Configuration Changes

Table 7-3 lists the roadway changes necessary to accommodate the guideway of Alternative 3. Figure 7-8 shows the location of these roadway changes in the Alternative 3 Study Area, except for the I-405 configuration changes, which occur throughout the corridor.

Table 7-3. Alternative 3: Roadway Changes

Location	From	To	Description of Change
Cotner Avenue	Nebraska Avenue	Santa Monica Boulevard	Roadway realignment to accommodate aerial guideway columns
Beloit Avenue	Massachusetts Avenue	Ohio Avenue	Roadway narrowing to accommodate aerial guideway columns
Sepulveda Boulevard	Getty Center Drive	Not Applicable	Southbound right turn lane to Getty Center Drive shortened to accommodate aerial guideway columns
I-405 Northbound On-Ramp and Off-Ramp at Sepulveda Boulevard near I-405 Exit 59	Sepulveda Boulevard near I-405 Northbound Exit 59	Sepulveda Boulevard/I-405 Undercrossing (near Getty Center)	Ramp realignment to accommodate aerial guideway columns and I-405 widening
Sepulveda Boulevard	I-405 Southbound Skirball Center Drive Ramps (north of Mountaingate Drive)	Skirball Center Drive	Roadway realignment into existing hillside to accommodate aerial guideway columns and I-405 widening
I-405 Northbound On-Ramp at Mulholland Drive	Mulholland Drive	Not Applicable	Roadway realignment into the existing hillside between the Mulholland Drive Bridge pier and abutment to accommodate aerial guideway columns and I-405 widening
Dickens Street	Sepulveda Boulevard	Ventura Boulevard	Permanent removal of street for Ventura Boulevard Station construction Pick-up/drop-off area would be provided along Sepulveda Boulevard at the truncated Dickens Street
Sherman Way	Haskell Avenue	Firmament Avenue	Median improvements, passenger drop-off and pick-up areas, and bus pads within existing travel lanes
Raymer Street	Sepulveda Boulevard	Van Nuys Boulevard	Curb extensions and narrowing of roadway width to accommodate aerial guideway columns
I-405	Sepulveda Boulevard Northbound Off-Ramp (Getty Center Drive interchange)	Sepulveda Boulevard Northbound On-Ramp (Getty Center Drive interchange)	I-405 widening to accommodate aerial guideway columns in the median
I-405	Skirball Center Drive	U.S. Highway 101	I-405 widening to accommodate aerial guideway columns in the median

Source: LASRE, 2024; HTA, 2024

Figure 7-8. Alternative 3: Roadway Changes

Source: LASRE, 2024; HTA, 2024

In addition to the changes made to accommodate the guideway, as listed in Table 7-3, roadways and sidewalks near stations would be reconstructed, which would result in modifications to curb ramps and driveways.

7.1.1.10 Ventilation Facilities

For ventilation of the monorail's underground portion, a plenum within the crown of the tunnel would provide a separate compartment for air circulation and allow multiple trains to operate between

stations. Vents would be located at the southern portal near the Federal Building parking lot, Wilshire/Metro D Line Station, UCLA Gateway Plaza Station, and at the northern portal near the Leo Baeck Temple parking lot. Emergency ventilation fans would be located at the UCLA Gateway Plaza Station and at the northern and southern tunnel portals.

7.1.1.11 Fire/Life Safety – Emergency Egress

Continuous emergency evacuation walkways would be provided along the guideway. Walkways along the alignment's aerial portions would typically consist of structural steel frames anchored to the guideway beams to support non-slip walkway panels. The walkways would be located between the two guideway beams for most of the aerial alignment; however, where the beams split apart, such as entering center-platform stations, short portions of the walkway would be located on the outside of the beams. For the underground portion of Alternative 3, 3.5-foot-wide emergency evacuation walkways would be located on both sides of the beams. Access to tunnel segments for first responders would be through stations.

7.1.2 Construction Activities

Construction activities for Alternative 3 would include constructing the aerial guideway and stations, underground tunnel and stations, and ancillary facilities, and widening I-405. Construction of the transit facilities through substantial completion is expected to have a duration of 8½ years. Early works, such as site preparation, demolition, and utility relocation, could start in advance of construction of the transit facilities.

Aerial guideway construction would begin at the southern and northern ends of the alignment and connect in the middle. Constructing the guideway would require a combination of freeway and local street lane closures throughout the working limits to provide sufficient work area. The first stage of I-405 widening would include a narrowing of adjacent freeway lanes to a minimum width of 11 feet (which would eliminate shoulders) and placing K-rail on the outside edge of the travel lanes to create outside work areas. Within these outside work zones, retaining walls, drainage, and outer pavement widenings would be constructed to allow for I-405 widening. The reconstruction of on- and off-ramps would be the final stage of I-405 widening.

A median work zone along I-405 for the length of the alignment would be required for erection of the guideway structure. In the median work zone, demolition of existing median and drainage infrastructure would be followed by the installation of new K-rails and installation of guideway structural components, which would include full directional freeway closures when guideway beams must be transported into the median work areas during late-night hours. Additional night and weekend directional closures would be required for installation of long-span structures over I-405 travel lanes where the guideway would transition from the median.

Aerial station construction is anticipated to last the duration of construction activities for Alternative 3 and would include the following general sequence of construction:

- Site clearing
- Utility relocation
- Construction fencing and rough grading
- CIDH pile drilling and installation
- Elevator pit excavation
- Soil and material removal

- Pile cap and pier column construction
- Concourse level and platform level falsework and cast-in-place structural concrete
- Guideway beam installation
- Elevator and escalator installation
- Completion of remaining concrete elements such as pedestrian bridges
- Architectural finishes and mechanical, electrical, and plumbing installation

Underground stations, including the Wilshire Boulevard/Metro D Line Station and the UCLA Gateway Plaza Station, would use a "cut-and-cover" construction method whereby the station structure would be constructed within a trench excavated from the surface that is covered by a temporary deck and backfilled during the later stages of station construction. Traffic and pedestrian detours would be necessary during underground station excavation until decking is in place and the appropriate safety measures are taken to resume cross traffic.

A tunnel boring machine (TBM) would be used to construct the underground segment of the guideway. The TBM would be launched from a staging area on Veteran Avenue south of Wilshire Boulevard, and head north toward an exit portal location north of Leo Baeck Temple. The southern portion of the tunnel between Wilshire Boulevard and the Bel Air Country Club would be at a depth between 80 to 110 feet from the surface to the top of the tunnel. The UCLA Gateway Plaza Station would be constructed using cut-and-cover methods. Through the Santa Monica Mountains, the tunnel would range between 30 to 300 feet deep.

Alternative 3 would require construction of a concrete casting facility for columns and beams associated with the elevated guideway. A specific site has not been identified; however, it is expected that the facility would be located on industrially zoned land adjacent to a truck route in either the Antelope Valley or Riverside County. When a site is identified, the contractor would obtain all permits and approvals necessary from the relevant jurisdiction, the appropriate air quality management entity, and other regulatory entities.

TPSS construction would require additional lane closures. Large equipment, including transformers, rectifiers, and switchgears would be delivered and installed through prefabricated modules where possible in at-grade TPSSs. The installation of transformers would require temporary lane closures on Exposition Boulevard, Beloit Avenue, and the I-405 northbound on-ramp at Burbank Boulevard.

Table 7-4 and Figure 7-9 show the potential construction staging areas for Alternative 3. Staging areas would provide the necessary space for the following activities:

- Contractors' equipment
- Receiving deliveries
- Storing materials
- Site offices
- Work zone for excavation
- Other construction activities (including parking and change facilities for workers, location of construction office trailers, storage, staging and delivery of construction materials and permanent plant equipment, and maintenance of construction equipment)

Table 7-4. Alternative 3: Construction Staging Locations

No.	Location Description
1	Public Storage between Pico Boulevard and Exposition Boulevard, east of I-405
2	South of Dowlen Drive and east of Greater LA Fisher House
3	Federal Building Parking Lot
4	Kinross Recreation Center and UCLA Lot 36
5	North end of the Leo Baeck Temple Parking Lot (tunnel boring machine retrieval)
6	At 1400 North Sepulveda Boulevard
7	At 1760 North Sepulveda Boulevard
8	East of I-405 and north of Mulholland Drive Bridge
9	Inside of I-405 Northbound to US-101 Northbound Loop Connector, south of US-101
10	ElectroRent Building south of G Line Busway, east of I-405
11	Inside the I-405 Northbound Loop Off-Ramp at Victory Boulevard
12	Along Cabrito Road east of Van Nuys Boulevard

Source: LASRE, 2024; HTA, 2024

Figure 7-9. Alternative 3: Construction Staging Locations

Source: LASRE, 2024; HTA, 2024

7.2 Existing Conditions

7.2.1 Population, Housing, and Employment Trends

Alternative 3 would be within the jurisdictions of the City of Los Angeles, the City of Santa Monica, and the Sawtelle VA community of Los Angeles County. Affected communities identified within the City of Los Angeles include Bel Air, Brentwood, Encino, Mar Vista, North Sherman Oaks, Palms, Panorama City, Van Nuys, West Los Angeles, and Westwood.

For purposes of the economic and fiscal effects analysis, Alternative 3 would include Transportation Analysis Zones (TAZ) from the Southern California Association of Governments' (SCAG) regional growth forecast and census tracts that intersect the areas within a 0.5-mile radius of the Alternative 3 proposed stations.

Projections of future population growth for Alternative 3 show a total increase of 12.1 percent from 2019 to 2045. Key areas such as the Wilshire Boulevard/Metro D Line Station (underground) are expected to experience a 23.0 percent rise in population, and the Metro E Line Expo/Sepulveda Station (aerial) area anticipates a 23.5 percent increase. Detailed population projections for Alternative 3 are included in Table 7-5. Without Alternative 3, it is likely that congestion and strain on the existing travel corridor would increase.

Table 7-5. Alternative 3: Future Population Growth

Area[a]	Population 2019	Population 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (A)	15,892	19,623	23.5	0.81
Santa Monica Boulevard Station (A)	25,848	30,648	18.6	0.66
Wilshire Boulevard/Metro D Line Station (U)	27,363	33,668	23.0	0.80
UCLA Gateway Plaza Station (U)	32,773	39,049	19.1	0.68
Getty Center Station (A)	10,197	9,840	-3.5	-0.14
Ventura Boulevard/Sepulveda Boulevard Station (A)	17,721	19,976	12.7	0.46
Metro G Line Sepulveda Station (A)	16,694	18,106	8.5	0.31
Sherman Way Station (A)	28,072	29,664	5.7	0.21
Van Nuys Metrolink Station (A)	25,138	26,151	4.0	0.15
Total[b]	**173,686**	**194,722**	**12.1**	**0.44**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 3 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

The Alternative 3 station areas are also projected to experience substantial increases to household totals between the years 2019 and 2045 (Table 7-6). Household growth along the corridor is notable, with a total increase of 29.8 percent by 2045. The area around the Metro E Line Expo/Sepulveda Station (aerial) is expected to experience a 40.9 percent rise in households, while the UCLA Gateway Plaza Station (underground) area anticipates a 44.7 percent increase. The Wilshire Boulevard/Metro D Line Station (underground) area is also projected to grow by 40.7 percent.

Table 7-6. Alternative 3: Future Household Growth

Area[a]	Households 2019	Households 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (A)	6,910	9,739	40.9	1.33
Santa Monica Boulevard Station (A)	12,340	16,179	31.1	1.05
Wilshire Boulevard/Metro D Line Station (U)	10,509	14,790	40.7	1.32
UCLA Gateway Plaza Station (U)	7,530	10,899	44.7	1.43
Getty Center Station (A)	3,833	4,163	8.6	0.32
Ventura Boulevard/Sepulveda Boulevard Station (A)	7,601	9,767	28.5	0.97
Metro G Line Sepulveda Station (A)	6,202	7,857	26.7	0.91
Sherman Way Station (A)	9,933	12,304	23.9	0.83
Van Nuys Metrolink Station (A)	7,469	9,379	25.6	0.88
Total[b]	**62,687**	**81,394**	**29.8**	**1.01**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 3 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

Employment projections for areas along the proposed Alternative 3 route show a total increase of 6.9 percent by 2045. Significant employment growth is expected around the Sherman Way Station (aerial) with a 10.7 percent increase, and the Van Nuys Metrolink Station (aerial) with a 9.4 percent rise. The UCLA Gateway Plaza Station (underground) area has a more modest growth forecast of 4.1 percent. (Table 7-7 provides detailed employment projections for Alternative 3.) Future transit options would likely improve support of workforce mobility and access as employment numbers increase throughout the region. Detailed employment counts for the relevant TAZs are included in Table 7-7.

Table 7-7. Alternative 3: Future Employment Growth

Area[a]	Employment 2019	Employment 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (A)	24,460	26,473	8.2	0.30
Santa Monica Boulevard Station (A)	27,002	29,382	8.8	0.33
Wilshire Boulevard/Metro D Line Station (U)	48,975	52,584	7.4	0.27
UCLA Gateway Plaza Station (U)	68,892	71,688	4.1	0.15
Getty Center Station (A)	8,054	8,319	3.3	0.12
Ventura Boulevard/Sepulveda Boulevard Station (A)	23,182	24,264	4.7	0.18
Metro G Line Sepulveda Station (A)	8,726	9,400	7.7	0.29
Sherman Way Station (A)	14,005	15,510	10.7	0.39
Van Nuys Metrolink Station (A)	10,509	11,497	9.4	0.35
Total[b]	**190,186**	**203,305**	**6.9**	**0.26**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 3 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

7.2.2 Fiscal Trends

The State of California has enjoyed healthy tax revenue growth for the previous decade. Table 7-8 illustrates the State of California's tax revenue for the years 2016, 2020, and 2022, with data sourced from the Federal Reserve Bank of St. Louis (2024). It shows a meaningful increase in both individual income tax and general sales and gross receipts tax over the period. Specifically, individual income tax revenue rose from $80,753 million in 2016 to $146,190 million in 2022. Similarly, general sales and gross receipts tax revenue increased from $39,189 million in 2016 to $52,228 million in 2022. The data highlight the substantial growth in the State of California's tax revenue from 2016 through 2022. Although it is unlikely that tax revenues will continue to grow at the rapid rate seen between 2020 and 2022, it is likely that tax revenue will continue to grow as the State of California's economy expands.

Table 7-8. Alternative 3: State of California Tax Revenue

Tax Revenue	2016 ($M)	2020 ($M)	2022 ($M)
Individual Income Tax	80,753	84,412	146,190
General Sales and Gross Receipts Tax	39,189	43,650	52,228

Source: Federal Reserve Bank of St. Louis, 2024

$M = millions of dollars

The City of Los Angeles has also experienced significant tax revenue growth during the previous decade. Table 5-5 includes property tax, sales tax, and general fund revenue for the City of Los Angeles for fiscal years (FY) 2016, 2020, and 2023. Property tax rose from $1,708 million in FY 2016 to $2,563 million in FY 2023, sales tax revenue rose from $438 million to $714 million over the same period, and the General Fund revenue for the City of Los Angeles rose from $4,893 million to $7,582 million.

Table 7-9. Alternative 3: City of Los Angeles Tax Revenue

Tax Revenue	2016 ($M)	FY 2020 ($M)	FY 2023 ($M)
Total Property Tax	1,708	2,261	2,563
Sales Tax	438	525	714
Total General Fund Revenue	4,893	7,009	7,582

Source: Controller's Office, City of Los Angeles, 2017, 2021, 2024

7.3 Environmental Impacts

Alternative 3 is expected to enhance economic development in the Los Angeles region by improving connectivity between the San Fernando Valley and the Westside of Los Angeles. This high-capacity rail transit alternative would provide efficient and reliable transportation for a large and growing travel market currently dependent on the congested Sepulveda Pass and nearby canyon roads.

One of the primary benefits of Alternative 3 would be the improved access it would provide to major employment, educational, and cultural centers in the greater Los Angeles area. By linking the Van Nuys Metrolink/Amtrak Station in the north with the Metro E Line in the south, Alternative 3 would facilitate smoother and faster commutes and reduce travel times compared to automobile travel along regularly congested I-405. This enhanced connectivity is expected to attract businesses and workers, which would

foster a more dynamic and integrated regional economy. The convenience of rapid transit access would likely stimulate real estate development and boost property values along the Sepulveda Transit Corridor.

Throughout the construction period and the operations period, Alternative 3 is anticipated to increase employment for the region. These jobs would range from construction and engineering roles to ongoing operational and maintenance positions, which would provide a healthy boost to local employment. Additionally, Alternative 3 would contribute to the long-term resiliency of the City of Los Angeles. By diversifying transportation options and reducing reliance on automobiles, the region would be better positioned to withstand economic shocks related to fuel price volatility or disruptions in road networks.

7.3.1 Construction Output, Earnings, and Employment

Construction of Alternative 3 would require substantial capital investment in the Los Angeles Metropolitan Statistical Area (MSA). The necessary spending would increase the employment, earnings, and output for the duration of the construction period. Capital cost estimates are in 2023 dollars, providing a common value for expenditures that would be distributed over several years. The following section describes the Alternative 3 expenditures and anticipated economic effects.

Capital expenditures for Alternative 3 are estimated at $18,603 million (2023 dollars). The breakdown of capital expenditures by category is shown in Table 7-10. Capital expenditures exclude ROW costs because purchasing ROW is not anticipated to support job creation. Acquiring and selling a property is a transfer of asset between entities, and there is no economic activity associated with it, except for small real estate/bank fees.

Table 7-10. Alternative 3: Summary of Capital Costs

Category	2023 ($M)
Design and Planning	4,638
Construction	13,104
Equipment	861
Total	**18,603**

Source: Metro 2024b

$M = millions of dollars
Note: Capital cost estimates are exclusive of right-of-way acquisition costs

To isolate the potential economic effects of Alternative 3 on the local economy and the State of California, it is typical to distinguish between resources that are new to the economy — those that would be invested in the Los Angeles-Long Beach-Anaheim MSA and/or the State of California under Alternative 3 — and resources that would be spent on projects in the region with similar economic effects (e.g., funds that would be allocated to other transportation construction projects in the area).

Two considerations determine the capital cost effects:

- Are the expenditures of the type likely to yield effects in the local economy?
- Are the funds used to make those expenditures new resources for the region?

At this stage of Alternative 3 development, the exact breakdown of funding distribution is subject to change. Alternative 3 is expected to be funded by a variety of local, state, and federal sources, including Measure M, which is a Los Angeles County voter-approved, no-sunset, half-cent sales tax that funds projects to ease traffic, expand public transportation, and more (Metro, 2016). Measure M partially funds many Metro projects (Metro, 2016). For this analysis, 100 percent of Alternative 3 costs are

treated as new funding to the region. This assumption yields an upper-limit estimate of economic output due to Alternative 3 construction. The actual effects post construction would likely be lower after expenditures planned under the No Project Alternative, such as the Measure M funds, are removed. The Regional Input-Output Modeling System (RIMS II) analysis can be updated to reflect more accurate outputs after more detailed funding allocations become available. Equipment for Alternative 3 is expected to be sourced from outside the State of California. Therefore, equipment-related costs are not considered in the analysis.

Each dollar of new resources is expected to yield an economic effect. Table 7-11 provides the multiplier values for the industry categories by geographic area.

Table 7-11. Alternative 3: Comparison of Regional Input-Output Modeling System Multipliers for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Industry	Final Demand Multiplier			Direct Effect	
		Output ($)	Earnings ($)	Employment	Earnings ($)	Employment
Los Angeles-Long Beach-Anaheim MSA	Design and Planning	2.0752	0.7202	9.638	1.7681	2.2741
	Construction (Tunnel, Track and Approaches)	1.882	0.4868	7.1079	1.8935	2.1094
State of California	Design and Planning	2.1309	0.7867	10.6262	1.8193	2.3616
	Construction (Tunnel, Track and Approaches)	1.9668	0.5812	8.5522	1.8995	2.1325

Source: U.S. Bureau of Economic Analysis, 2024

$ = dollars

Using the construction industry as an example, the multipliers in Table 7-11 are interpreted as follows:

- The Final Demand Output Multiplier represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Employment Multiplier represents the total change in number of jobs that occurs in all industries for each $1 million of output delivered to final demand by the construction industry.
- The Direct Effect Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the construction industry.
- The Direct Effect Employment Multiplier represents the total change in number of jobs in all industries for each additional job in the construction industry.

Applying the Final Demand Multipliers for the construction industry to the amount of funding/resources allocated for capital expenditures provides estimates of the net output, earnings, and employment effects generated by Alternative 3 in each region. The results are summarized in Table 7-12 and Table 7-13. It is important to note that these effects are one-time effects lasting for the duration of Alternative 3 construction. One job is defined as a job for one person with a duration of one year. For example, a job for one person lasting three years would be defined as three person-year jobs.

It is noteworthy that the economic effects at the MSA level and at the state level are not additive. The economic effects at the MSA level assume that the Alternative 3 costs, with the exception of vehicle costs which were removed, would be incurred entirely in the Los Angeles-Long Beach-Anaheim MSA. Likewise, the economic effects at the state level assume that the Alternative 3 costs, also with the exception of vehicle costs, would be incurred entirely in the State of California. As previously discussed in Section 3.2.1.4, this is a high estimate because 100 percent of funding is assumed to be new to the MSA and the State of California, respectively. Table 7-12 and Table 7-13 outline two separate scenarios and illustrate the maximum economic benefits achievable from each one. For example, Alternative 3 would not generate 133,600 person-years of employment within the MSA (Table 7-12) and 156,400 within the State of California (Table 7-13) simultaneously; these two values should be considered individually.

Table 7-12. Alternative 3: Net Effects of Capital Expenditure on the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Year Jobs)
Design and Planning	4,638	2.0752	0.7202	9.638	9,625	3,340	43,327
Construction (Tunnel, Track and Approaches)	13,104	1.882	0.4868	7.1079	24,661	6,379	90,272
Total	**17,742**				**34,286**	**9,719**	**133,599**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the Los Angeles-Long Beach-Anaheim MSA, the construction spending for Alternative 3 is expected to generate $24,661 million in output (in 2023 dollars), $6,379 million in earnings, and over 90,200 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $9,625 million, earnings of $3,340 million, and employment of over 43,300 person-year jobs.

Table 7-13. Alternative 3: Net Effects of Capital Expenditure on the State of California

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person--year Jobs)
Design and Planning	4,638	2.1309	0.7867	10.6262	9,884	3,649	47,769
Construction (Tunnel, Track and Approaches)	13,104	1.9668	0.5812	8.5522	25,772	7,616	108,615
Total	**17,742**				**35,656**	**11,265**	**156,385**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the State of California, the construction spending for Alternative 3 is expected to generate $25,772 million in output (in 2023 dollars), $7,616 million in earnings, and over 108,600 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $9,884 million, earnings of $3,649 million, and employment of over 47,700 person-year jobs.

7.3.2 Operational Output, Earnings, and Employment

Alternative 3 is expected to generate reoccurring employment and earnings for the region in the form of operation and maintenance staff, facility operators, and maintenance expenditures. The operations and maintenance (O&M) expenditures for Alternative 3 are expected to have a beneficial, but not substantial effect on local employment, relative to the overall employment of the region.

7.3.3 Fiscal Effects

The wages generated from Alternative 3 would boost tax revenues at the state and county levels. The middle-income tax rate of 9.3 percent was chosen for the analysis, because it covers the widest range of middle-income households, those with an annual income between $68,350 and $349,137, as shown in Table 7-14. Due to possible spillage into other income tax brackets and accounting for the limitations of this methodology, the final income and sales tax revenue generated from Alternative 3 should be considered estimates. The assumed 9.3 percent tax rate is an upper-limit estimate. The effective tax rate would be lower than 9.3 percent due to the first $68,350 of household income being taxed at the lower tax bracket. Sales tax rates for the State of California and Los Angeles County are provided in Table 7-15.

Table 7-14. Alternative 3: State of California Income Tax Rates

Income Bracket	Income Tax Rate
$0 - $10,412	1.00%
$10,412 - $24,684	2.00%
$24,684 - $38,959	4.00%
$38,959 - $54,081	6.00%
$54,081 - $68,350	8.00%
$68,350 - $349,137	9.30%
$349,137 - $418,961	10.30%
$418,961 - $698,271	11.30%
> $698,271	12.30%

Source: California Franchise Tax Board, 2023

Table 7-15. Alternative 3: Sales Tax Rates for the State of California and Los Angeles County

Region	Sales Tax Rate
State of California	7.25%
Los Angeles County	9.50%

Source: California Department of Tax and Fee Administration, 2024

7.3.3.1 Income Tax Revenue

To calculate the additional income tax earnings for the State of California, the median income tax bracket of 9.3 percent was used. For the Los Angeles-Long Beach-Anaheim MSA, the average income tax rate for the area was applied to the earnings generated within the MSA.

Table 7-16 shows the additional income tax generated to the MSA and the state under Alternative 3. The Los Angeles-Long Beach-Anaheim MSA would generate additional income tax revenue of $903 million. The State of California would generate additional income tax revenue of $1,048 million. As discussed earlier in Section 7.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 7-16. Alternative 3: Additional Income Tax Generated Earnings for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings (2023 $M)	Income Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	9,719	903
State of California	11,265	1,048

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

7.3.3.2 Sales Tax Revenue

The incremental consumption from new earnings would also boost sale tax revenues for the MSA and state. To estimate the potential increase in sales tax, calculations should account for the portion of consumption subject to sales tax and income tax deductions, as follows:

- Consumption expenditure subject to sales tax requires the identification of the share of the consumption basket that is taxable. The categories included in the analysis represent the typical expenditure for a home in the State of California. Taxable expenditures include food away from home, alcoholic beverages, apparel and services, transportation, entertainment, and personal care products (Table 7-17). For the State of California, around 29 percent of consumption expenditures are subject to sales tax (U.S. Bureau of Labor Statistics, 2020). The 29 percent value is applied to both the MSA and State of California earnings to generate the expected sales tax revenue increase. A breakdown of California household annual taxable expenditures is available in Table 7-18. Household expenditures are based on the U.S. Bureau of Labor Statistics calculated average of 2.7 individuals per California household.
- After-tax earnings exclude income tax from gross earnings, as identified in Table 7-18.

Table 7-17. Alternative 3: Average Household Annual Taxable Expenditures in the State of California, 2019-2020

Category	Expenditure Means
Food away from home	$3,596.47
Alcoholic beverages	$666.20
Apparel and services	$1,738.69
Transportation	$10,499.82
Entertainment	$3,134.81
Personal care products	$813.00
Total	**$20,448.99**
Average annual expenditures	$70,830.25
Annual expenditures subject to sales tax	**29%**

Source: U.S. Bureau of Labor Statistics, 2020

Table 7-18 provides the additional sales tax generated from the MSA and state under Alternative 3. The MSA and State of California would generate sales tax earnings of $243 million and $214 million, respectively. As discussed earlier in Section 7.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 7-18. Alternative 3: Sales Tax Revenues Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and State of California

Region	Earnings after Income Tax Deductions (2023 $M)[a]	Taxable Consumption Expenditure (2023 $M)[b]	Sales Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	8,815	2,556	243
State of California	10,217	2,963	214

Source: BEA, 2024; Metro, 2024b

[a]This is equal to the total consumption expenditure
[b]Figured at 29 percent of total consumption expenditure.

2023 $M = millions in 2023 dollars

7.3.3.3 Property Tax Revenue

To construct Alternative 3, it would be necessary to acquire private land and structures for easements, ROWs, parking, and station facilities. These acquisitions would remove the properties from the local tax base, which would reduce annual tax revenue.

Including temporary takes during construction and applying a conservative assumption that both partial and full takes would result in property tax loss for the full parcel, it is estimated that less than 0.12 percent of the Los Angeles County or City of Los Angeles annual property tax revenue would be impacted relative to 2023 assessed parcel values and the total 2023 property tax revenues (County of Los Angeles, 2023; Controller's Office, City of Los Angeles, 2024). The calculated revenue loss would be well below the annual change in levied taxes, which increased 5.5 percent in fiscal year 2022-2023 from fiscal year 2022-2023 (County of Los Angeles, 2023). The projected loss in tax revenues associated with Alternative 3 would not compromise the county's or city's ability to provide services or generate an adverse effect.

Additionally, proximity to public transit can increase property values in both residential and commercial real estate markets (APTA, 2019), potentially offsetting property tax loss from parcel acquisition. For example, between 2012 and 2016, residential property values near transit areas increased by 61 percent, 8 percentage points more than in non-transit areas. Commercial properties near transit performed better than other commercial properties in the region, with a 73 percent increase in property value in the transit areas versus 58 percent in the region.

7.4 Mitigation Measures

7.4.1 Construction Effects

Table 7-19 shows the additional annual employment generated in the short term is 0.25 percent of existing employment in the Los Angeles-Long Beach-Anaheim MSA and 0.10 percent of existing employment in the State of California. Additionally, the employment generated as a result of Alternative 3 would be distributed throughout the construction life of Alternative 3. The more than 133,500 person-year jobs would not occur within the same year, smoothing the effects of Alternative 3 related employment further. Assuming an 8½ year construction timeline for Alternative 3, the alternative is projected to generate an additional 15,718 jobs annually within the MSA. Additional employment generated from Alternative 3 would be a relatively small increase in overall employment and would have beneficial effects on the local economy. Therefore, no mitigation measures are required.

Table 7-19. Alternative 3: Employment Effects Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Short-Term Employment Generated (Person-Year Jobs)	Jobs Created Annually (8½ year construction schedule)	Existing Employment[a] (2024)	Short-Term Employment Generated[b]
Los Angeles-Long Beach-Anaheim MSA	133,599	15,718	6,346,100	0.25%
State of California	156,385	18,398	18,104,800	0.10%

Source: U.S. Bureau of Labor Statistics, 2025a, 2025b

[a]October 2024 Total Nonfarm, Not Seasonally Adjusted
[b]Jobs Created Annually/Employment

7.4.2 Operational Effects

Annual O&M costs would be a fraction of the construction costs, which would require no mitigation measures. Therefore, there will also be no mitigation measures required for operational effects.

7.4.3 Impacts After Mitigation

No mitigation measures are required; impacts are less than significant.

8 ALTERNATIVE 4

8.1 Alternative Description

Alternative 4 is a heavy rail transit (HRT) system with a hybrid underground and aerial guideway track configuration that would include four underground stations and four aerial stations. This alternative would provide transfers to five high-frequency fixed guideway transit and commuter rail lines, including the Los Angeles County Metropolitan Transportation Authority's (Metro) E, Metro D, and Metro G Lines, the East San Fernando Valley Light Rail Transit Line, and the Metrolink Ventura County Line. The length of the alignment between the terminus stations would be approximately 13.9 miles, with 5.7 miles of aerial guideway and 8.2 miles of underground configuration.

The four underground and four aerial HRT stations would be as follows:

1. Metro E Line Expo/Sepulveda Station (underground)
2. Santa Monica Boulevard Station (underground)
3. Wilshire Boulevard/Metro D Line Station (underground)
4. UCLA Gateway Plaza Station (underground)
5. Ventura Boulevard/Sepulveda Boulevard Station (aerial)
6. Metro G Line Sepulveda Station (aerial)
7. Sherman Way Station (aerial)
8. Van Nuys Metrolink Station (aerial)

8.1.1 Operating Characteristics

8.1.1.1 Alignment

As shown on Figure 8-1, from its southern terminus station at the Metro E Line Expo/Sepulveda Station, the alignment of Alternative 4 would run underground north through the Westside of Los Angeles (Westside) and the Santa Monica Mountains to a tunnel portal south of Ventura Boulevard in the San Fernando Valley (Valley). At the tunnel portal, the alignment would transition to an aerial guideway that would generally run above Sepulveda Boulevard before curving eastward along the south side of the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor to the northern terminus station adjacent to the Van Nuys Metrolink/Amtrak Station.

The proposed southern terminus station would be located underground east of Sepulveda Boulevard between the existing elevated Metro E Line tracks and Pico Boulevard. Tail tracks for vehicle storage would extend underground south of National Boulevard east of Sepulveda Boulevard. The alignment would continue north beneath Bentley Avenue before curving northwest to an underground station at the southeast corner of Santa Monica Boulevard and Sepulveda Boulevard. From the Santa Monica Boulevard Station, the alignment would continue and curve eastward toward the Wilshire Boulevard/Metro D Line Station beneath the Metro D Line Westwood/UCLA Station, which is currently under construction as part of the Metro D Line Extension Project. From there, the underground alignment would curve slightly to the northeast and continue beneath Westwood Boulevard before reaching the UCLA Gateway Plaza Station.

Figure 8-1. Alternative 4: Alignment

Source: STCP, 2024; HTA, 2024

From the UCLA Gateway Plaza Station, the alignment would turn to the northwest beneath the Santa Monica Mountains to the east of Interstate 405 (I-405). South of Mulholland Drive, the alignment would curve to the north to reach a tunnel portal at Del Gado Drive, just east of I-405 and south of Sepulveda Boulevard.

The alignment would transition from an underground configuration to an aerial guideway structure after exiting the tunnel portal and would continue northeast to the Ventura Boulevard/Sepulveda Boulevard

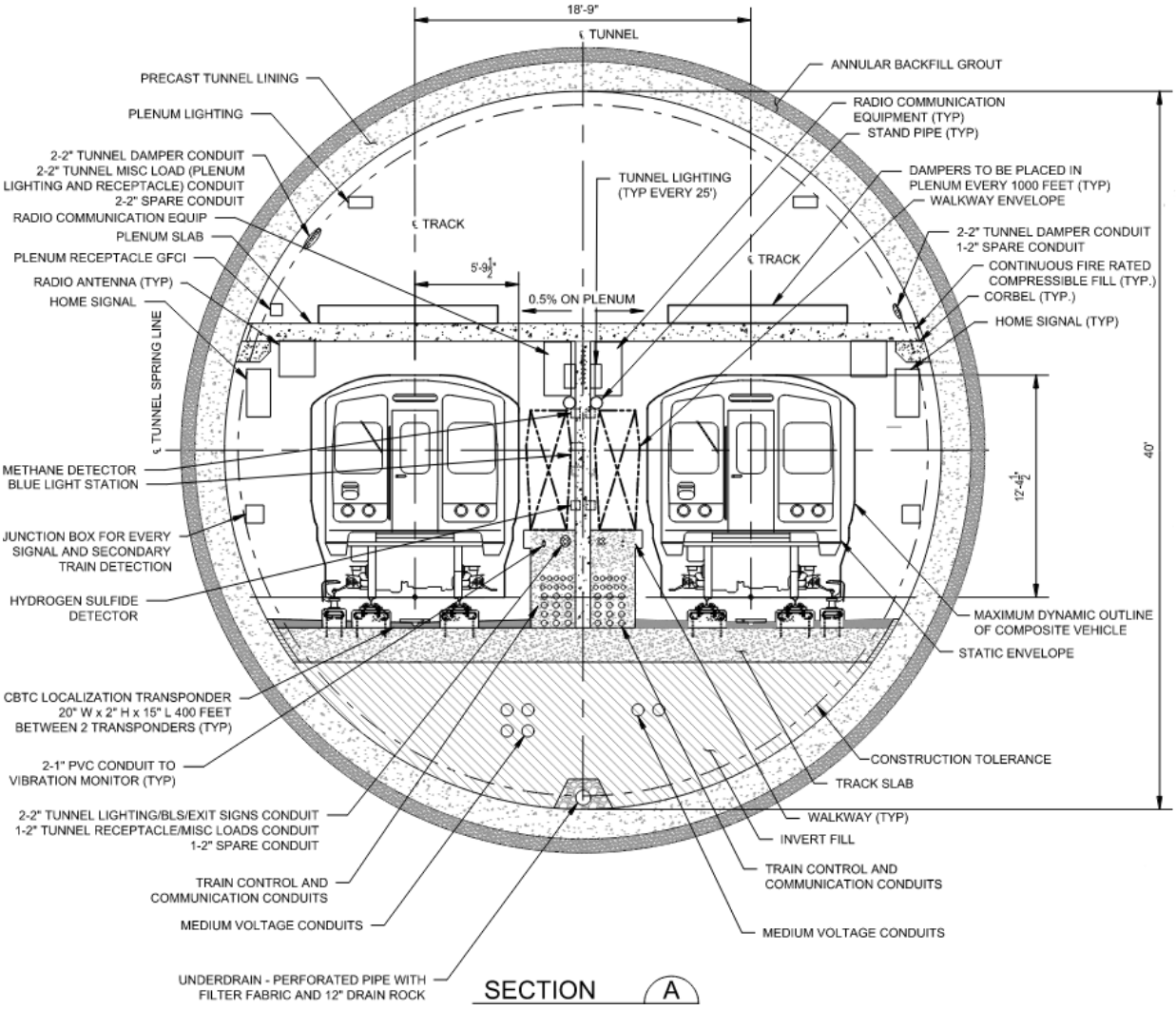
Station located over Dickens Street, immediately west of the Sepulveda Boulevard and Dickens Street intersection. North of the station, the aerial guideway would transition to the center median of Sepulveda Boulevard. The aerial guideway would continue north on Sepulveda Boulevard and cross over U.S. Highway 101 (US-101) and the Los Angeles River before continuing to the Metro G Line Sepulveda Station, immediately south of the Metro G Line Busway. Overhead utilities along Sepulveda Boulevard in the Valley would be undergrounded where they would conflict with the guideway or its supporting columns.

The aerial guideway would continue north above Sepulveda Boulevard where it would reach the Sherman Way Station just south of Sherman Way. After leaving the Sherman Way Station, the alignment would continue north before curving to the southeast to parallel the LOSSAN rail corridor on the south side of the existing tracks. Parallel to the LOSSAN rail corridor, the guideway would conflict with the existing Willis Avenue Pedestrian Bridge, which would be demolished. The alignment would follow the LOSSAN rail corridor before reaching the proposed northern terminus Van Nuys Metrolink Station located adjacent to the existing Metrolink/Amtrak Station. Tail tracks and yard lead tracks would descend to a proposed at-grade maintenance and storage facility (MSF) east of the northern terminus station. Modifications to the existing pedestrian underpass to the Metrolink platforms to accommodate these tracks would result in reconfiguration of an existing rail spur serving City of Los Angeles Department of Water and Power (LADWP) property.

8.1.1.2 Guideway Characteristics

Alternative 4 would utilize a single-bore tunnel configuration for underground tunnel sections, with an outside diameter of approximately 43.5 feet. The tunnel would include two parallel tracks with 18.75-foot track spacing in tangent sections separated by a continuous central dividing wall throughout the tunnel. Inner walkways would be constructed adjacent to the two tracks. Inner and outer walkways would be constructed within tunnel sections near the track crossovers. At the crown of tunnel, a dedicated air plenum would be provided by constructing a concrete slab above the railway corridor. The air plenum would allow for ventilation throughout the underground portion of the alignment. Figure 8-2 illustrates these components at a typical cross-section of the underground guideway.

Figure 8-2. Typical Underground Guideway Cross-Section

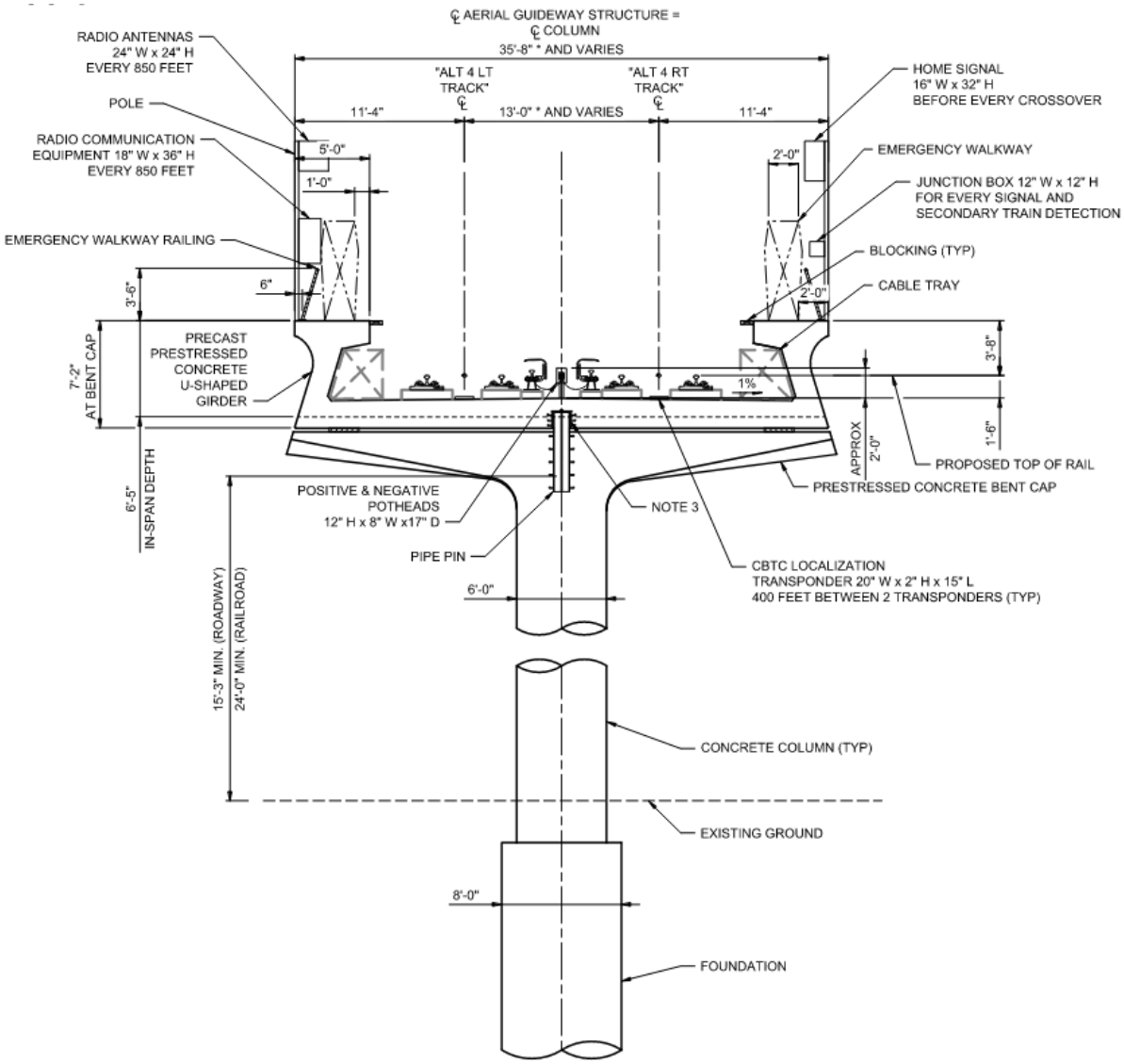


Source: STCP, 2024

In aerial sections, the guideway would be supported by either single columns or straddle-bents. Both types of structures would support a U-shaped concrete girder and the HRT track. The aerial guideway would be approximately 36 feet wide. The track would be constructed on the concrete girders with direct fixation and would maintain a minimum of 13 feet between the centerlines of the two tracks. On the outer side of the tracks, emergency walkways would be constructed with a minimum width of 2 feet.

The single-column pier would be the primary aerial structure throughout the aerial portion of the alignment. Crash protection barriers would be used to protect columns located in the median of Sepulveda Boulevard in the Valley. Figure 8-3 shows a typical cross-section of the single-column aerial guideway.

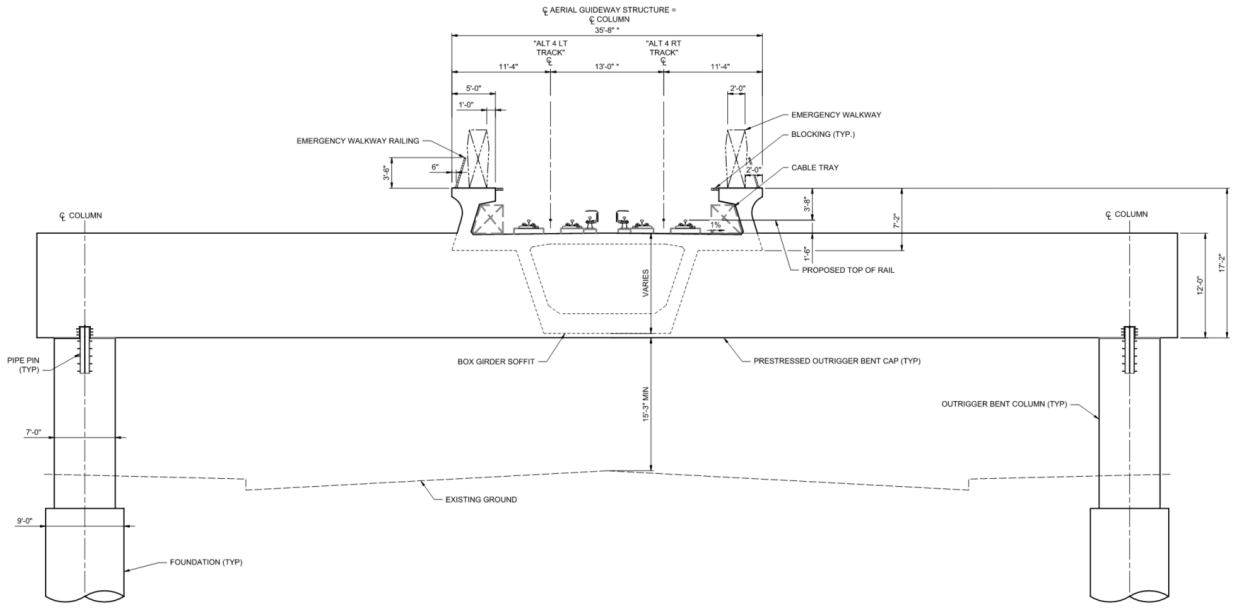
Figure 8-3. Typical Aerial Guideway Cross-Section



Source: STCP, 2024

In order to span intersections and maintain existing turn movements, sections of the aerial guideway would be supported by straddle bents, a concrete straddle-beam placed atop two concrete columns constructed outside of the underlying roadway. Figure 8-4 illustrates a typical straddle-bent configuration.

Figure 8-4. Typical Aerial Straddle-Bent Cross-Section



Source: STCP, 2024

8.1.1.3 Vehicle Technology

Alternative 4 would utilize steel-wheel HRT trains, with automated train operations and planned peak-period headways of 2.5 minutes and off-peak-period headways ranging from 4 to 6 minutes. Each train could consist of three or four cars with open gangways between cars. The HRT vehicle would have a maximum operating speed of 70 miles per hour; actual operating speeds would depend on the design of the guideway and distance between stations. Train cars would be approximately 10 feet wide with three double doors on each side. Each car would be approximately 72 feet long with capacity for 170 passengers. Trains would be powered by a third rail.

8.1.1.4 Stations

Alternative 4 would include four underground stations and four aerial stations with station platforms measuring 280 feet long for both station configurations. The aerial stations would be constructed a minimum of 15.25 feet above ground level, supported by rows of dual columns with 8-foot diameters. The southern terminus station would be adjacent to the Metro E Line Expo/Sepulveda Station, and the northern terminus station would be adjacent to the Van Nuys Metrolink/Amtrak Station.

All stations would be side-platform stations where passengers would select and travel to station platforms depending on their direction of travel. All stations would include 20-foot-wide side platforms separated by 30 feet for side-by-side trains. Aerial station platforms would be covered, but not enclosed. Each underground station would include an upper and lower concourse level prior to reaching the train platforms. Each aerial station, except for the Sherman Way Station, would include a mezzanine level prior to reaching the station platforms. At the Sherman Way Station, separate entrances on opposite sides of the street would provide access to either the northbound or southbound platform with an overhead pedestrian walkway providing additional connectivity across platforms. Each station would have a minimum of two elevators, two escalators, and one stairway from the ground level to the concourse or mezzanine.

Stations would include automatic, bi-parting fixed doors along the edges of station platforms. These platform screen doors would be integrated into the automatic train control system and would not open unless a train is stopped at the platform.

The following information describes each station, with relevant entrance, walkway, and transfer information. Bicycle parking would be provided at each station.

Metro E Line Expo/Sepulveda Station

- This underground station would be located just north of the existing Metro E Line Expo/Sepulveda Station, on the east side of Sepulveda Boulevard.
- A station entrance would be located on the east side of Sepulveda Boulevard north of the Metro E Line.
- A walkway to transfer to the Metro E Line would be provided at street level within the fare paid zone.
- A 126-space parking lot would be located immediately north of the station entrance, east of Sepulveda Boulevard. Passengers would also be able to park at the existing Metro E Line Expo/Sepulveda Station parking facility, which provides 260 parking spaces.

Santa Monica Boulevard Station

- This underground station would be located under the southeast corner of Santa Monica Boulevard and Sepulveda Boulevard.
- The station entrance would be located on the south side of Santa Monica Boulevard between Sepulveda Boulevard and Bentley Avenue.
- No dedicated station parking would be provided at this station.

Wilshire Boulevard/Metro D Line Station

- This underground station would be located beneath the Metro D Line tracks and platform under Gayley Avenue between Wilshire Boulevard and Lindbrook Drive.
- Station entrances would be provided on the northeast corner of Wilshire Boulevard and Gayley Avenue and on the northeast corner of Lindbrook Drive and Gayley Avenue. Passengers would also be able to use the Metro D Line Westwood/UCLA Station entrances to access the station platform.
- A direct internal station transfer to the Metro D Line would be provided at the south end of the station.
- No dedicated station parking would be provided at this station.

UCLA Gateway Plaza Station

- This underground station would be located underneath Gateway Plaza on the University of California, Los Angeles (UCLA) campus.
- Station entrances would be provided on the north side of Gateway Plaza and on the east side of Westwood Boulevard across from Strathmore Place.
- No dedicated station parking would be provided at this station.

Ventura Boulevard/Sepulveda Boulevard Station

- This aerial station would be located west of Sepulveda Boulevard spanning over Dickens Street.

- A station entrance would be provided on the west side of Sepulveda Boulevard south of Dickens Street.
- A 52-space parking lot would be located adjacent to the station entrance on the southwest corner of the Sepulveda Boulevard and Dickens Street intersection, and an additional 40-space parking lot would be located on the northwest corner of the same intersection.

Metro G Line Sepulveda Station

- This aerial station would be located over Sepulveda Boulevard immediately south of the Metro G Line Busway.
- A station entrance would be provided on the west side of Sepulveda Boulevard south of the Metro G Line Busway.
- An elevated pedestrian walkway would connect the platform level of the proposed station to the planned aerial Metro G Line Busway platforms within the fare paid zone.
- Passengers would be able to park at the existing Metro G Line Sepulveda Station parking facility, which has a capacity of 1,205 parking spaces. Currently, only 260 parking spaces are used for transit parking. No additional automobile parking would be provided at the proposed station.

Sherman Way Station

- This aerial station would be located over Sepulveda Boulevard between Sherman Way and Gault Street.
- Station entrances would be provided on either side of Sepulveda Boulevard south of Sherman Way.
- A 46-space parking lot would be located on the northwest corner of the Sepulveda Boulevard and Gault Street intersection, and an additional 76-space parking lot would be located west of the station along Sherman Way.

Van Nuys Metrolink Station

- This aerial station would span Van Nuys Boulevard, just south of the LOSSAN rail corridor.
- The primary station entrance would be located on the east side of Van Nuys Boulevard just south of the LOSSAN rail corridor. A secondary station entrance would be located between Raymer Street and Van Nuys Boulevard.
- An underground pedestrian walkway would connect the station plaza to the existing pedestrian underpass to the Metrolink/Amtrak platform outside the fare paid zone.
- Existing Metrolink Station parking would be reconfigured, maintaining approximately the same number of spaces, but 66 parking spaces would be relocated west of Van Nuys Boulevard. Metrolink parking would not be available to Metro transit riders.

8.1.1.5 Station-To-Station Travel Times

Table 8-1 presents the station-to-station distance and travel times at peak period for Alternative 4. The travel times include both run time and dwell time. Dwell time is 30 seconds for transfer stations and 20 seconds for other stations. Northbound and southbound travel times vary slightly because of grade differentials and operational considerations at end-of-line stations.

Table 8-1. Alternative 4: Station-to-Station Travel Times and Station Dwell Times

From Station	To Station	Distance (miles)	Northbound Station-to-Station Travel Time (seconds)	Southbound Station-to-Station Travel Time (seconds)	Dwell Time (seconds)
Metro E Line Station					*30*
Metro E Line	Santa Monica Boulevard	0.9	89	86	—
Santa Monica Boulevard Station					*20*
Santa Monica Boulevard	Wilshire/Metro D Line	0.9	91	92	—
Wilshire/Metro D Line Station					*30*
Wilshire/Metro D Line	UCLA Gateway Plaza	0.7	75	68	—
UCLA Gateway Plaza Station					*20*
UCLA Gateway Plaza	Ventura Boulevard	6.1	376	366	—
Ventura Boulevard Station					*20*
Ventura Boulevard	Metro G Line	1.9	149	149	—
Metro G Line Station					*30*
Metro G Line	Sherman Way	1.4	110	109	—
Sherman Way Station					*20*
Sherman Way	Van Nuys Metrolink	1.9	182	180	—
Van Nuys Metrolink Station					*30*

Source: STCP, 2024

— = no data

8.1.1.6 Special Trackwork

Alternative 4 would include 10 double crossovers throughout the alignment, enabling trains to cross over to the parallel track. Each terminus station would include a double crossover immediately north and south of the station. Except for the Santa Monica Boulevard Station, each station would have a double crossover immediately south of the station. The remaining crossovers would be located along the alignment midway between the UCLA Gateway Plaza Station and the Ventura Boulevard Station.

8.1.1.7 Maintenance and Storage Facility

The MSF for Alternative 4 would be located east of the Van Nuys Metrolink Station and would encompass approximately 46 acres. The MSF would be designed to accommodate 184 rail cars and would be bounded by single-family residences to the south, the LOSSAN rail corridor to the north, Woodman Avenue on the east, and Hazeltine Avenue and industrial manufacturing enterprises to the west. Trains would access the site from the fixed guideway's tail tracks at the northwest corner of the site. Trains would then travel southeast to maintenance facilities and storage tracks.

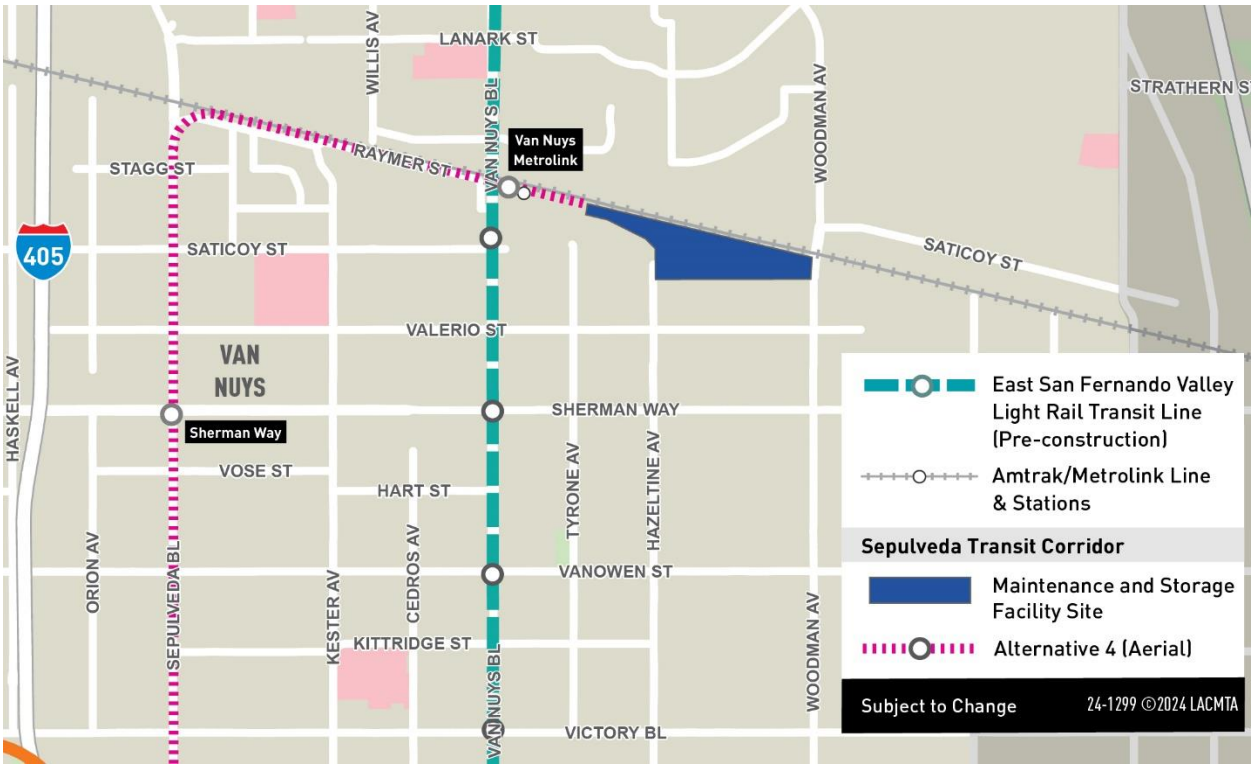
The site would include the following facilities:

- Two entrance gates with guard shacks
- Main shop building
- Maintenance-of-way building
- Storage tracks
- Carwash building
- Cleaning and inspections platforms
- Material storage building
- Hazmat storage locker

- Traction power substation (TPSS) located on the west end of the MSF to serve the mainline
- TPSS located on the east end of the MSF to serve the yard and shops
- Parking area for employees
- Grade separated access roadway (over the HRT tracks at the east end of the facility, and necessary drainage)

Figure 8-5 shows the location of the MSF site for Alternative 4.

Figure 8-5. Alternative 4: Maintenance and Storage Facility Site



Source: STCP, 2024; HTA, 2024

8.1.1.8 Traction Power Substations

TPSSs transform and convert high voltage alternating current supplied from power utility feeders into direct current suitable for transit operation. Twelve TPSS facilities would be located along the alignment and would be spaced approximately 0.5 to 2.5 miles apart. TPSS facilities would generally be located within the stations, adjacent to the tunnel through the Santa Monica Mountains, or within the MSF. TPSSs would be approximately 2,000 to 3,000 square feet. Table 8-2 lists the TPSS locations for Alternative 4.

Figure 8-6 shows the TPSS locations along the Alternative 4 alignment.

Table 8-2. Alternative 4: Traction Power Substation Locations

TPSS No.	Location Description	Configuration
1	TPSS 1 would be located east of Sepulveda Boulevard and north of the Metro E Line.	Underground (within station)

TPSS No.	Location Description	Configuration
2	TPSS 2 would be located south of Santa Monica Boulevard between Sepulveda Boulevard and Bentley Avenue.	Underground (within station)
3	TPSS 3 would be located at the southeast corner of UCLA Gateway Plaza.	Underground (within station)
4	TPSS 4 would be located south of Bellagio Road and west of Stone Canyon Road.	Underground (adjacent to tunnel)
5	TPSS 5 would be located west of Roscomare Road between Donella Circle and Linda Flora Drive.	Underground (adjacent to tunnel)
6	TPSS 6 would be located east of Loom Place between Longbow Drive and Vista Haven Road.	Underground (adjacent to tunnel)
7	TPSS 7 would be located west of Sepulveda Boulevard between the I-405 Northbound On-Ramp and Dickens Street.	At-grade (within station)
8	TPSS 8 would be located west of Sepulveda Boulevard between the Metro G Line Busway and Oxnard Street.	At-grade (within station)
9	TPSS 9 would be located at the southwest corner of Sepulveda Boulevard and Sherman Way.	At-grade (within station)
10	TPSS 10 would be located south of the LOSSAN rail corridor and north of Raymer Street and Kester Avenue.	At-grade
11	TPSS 11 would be located south of the LOSSAN rail corridor and east of the Van Nuys Metrolink Station.	At-grade (within MSF)
12	TPSS 12 would be located south of the LOSSAN rail corridor and east of Hazeltine Avenue.	At-grade (within MSF)

Source: STCP, 2024; HTA, 2024

Figure 8-6. Alternative 4: Traction Power Substation Locations

Source: STCP, 2024; HTA, 2024

8.1.1.9 Roadway Configuration Changes

Table 8-3 lists the roadway changes necessary to accommodate the guideway of Alternative 4. Figure 8-7 shows the location of roadway changes in the Alternative 4 Study Area, and Figure 8-8 shows detail of the street vacation at Del Gado Drive.

In addition to the changes made to accommodate the guideway, as listed in Table 8-3, roadways and sidewalks near stations would be reconstructed, resulting in modifications to curb ramps and driveways.

Table 8-3. Alternative 4: Roadway Changes

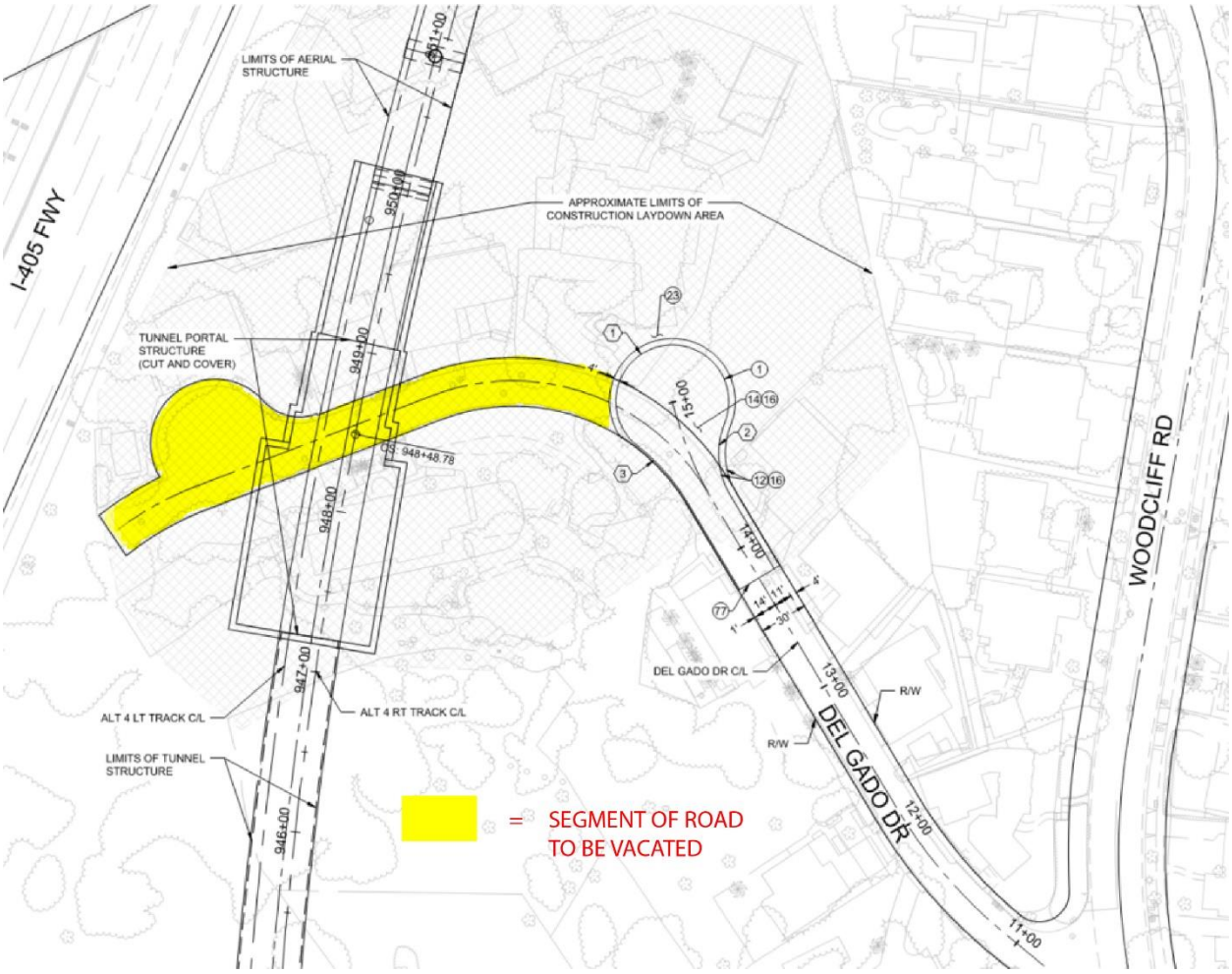
Location	From	To	Description of Change
Del Gado Drive	Woodcliff Road	Not Applicable	Vacation of approximately 325 feet of Del Gado Drive east of I-405 to accommodate tunnel portal
Sepulveda Boulevard	Ventura Boulevard	Raymer Street	Construction of raised median and removal of all on-street parking on the southbound side of the street and some on-street parking on the northbound side of the street to accommodate aerial guideway columns
Sepulveda Boulevard	La Maida Street	Not Applicable	Prohibition of left turns to accommodate aerial guideway columns
Sepulveda Boulevard	Valleyheart Drive South, Hesby Street, Hartsook Street, Archwood Street, Hart Street, Leadwell Street, Covello Street	Not Applicable	Prohibition of left turns to accommodate aerial guideway columns
Raymer Street	Kester Avenue	Keswick Street	Reconstruction resulting in narrowing of width and removal of parking on the westbound side of the street to accommodate aerial guideway columns

Source: STCP, 2024; HTA, 2024

Figure 8-7. Alternative 4: Roadway Changes

Source: STCP, 2024; HTA, 2024

Figure 8-8. Alternative 4: Street Vacation at Del Gado Drive



Source: STCP, 2024; HTA, 2024

8.1.1.10 Ventilation Facilities

For ventilation of the alignment's underground portion, a plenum within the crown of the tunnel would provide a separate compartment for air circulation and allow multiple trains to operate between stations. Each underground station would include a fan room with additional ventilation facilities. Alternative 4 would also include a stand-alone ventilation facility at the tunnel portal on the northern end of the tunnel segment, located east of I-405 and south of Del Gado Drive. Within this facility, ventilation fan rooms would provide both emergency ventilation, in case of a tunnel fire, and regular ventilation, during non-revenue hours. The facility would also house sump pump rooms to collect water from various sources, including storm water; wash water (from tunnel cleaning); and water from a fire-fighting incident, system testing, or pipe leaks.

8.1.1.11 Fire/Life Safety – Emergency Egress

Within the tunnel segment, emergency walkways would be provided between the center dividing wall and each track. Sliding doors would be located in the central dividing wall at required intervals to connect the two sides of the railway with a continuous walkway to allow for safe egress to a point of safety (typically at a station) during an emergency. Similarly, the aerial guideway would include two

emergency walkways with safety railing located on the outer side of the tracks. Access to tunnel segments for first responders would be through stations and the portal.

8.1.2 Construction Activities

Temporary construction activities for Alternative 4 would occur within project work zones at permanent facility locations, construction staging and laydown areas, and construction office areas. Construction of the transit facilities through substantial completion is expected to have a duration of 8¼ years. Early works, such as site preparation, demolition, and utility relocation, could start in advance of construction of the transit facilities.

For the guideway, Alternative 4 would consist of a single-bore tunnel through the Westside and Santa Monica Mountains. The tunnel would be comprised of two separate segments, one running north from the southern terminus to the UCLA Gateway Plaza Station (Westside segment), and the other running south from the portal in the San Fernando Valley to the UCLA Gateway Plaza Station (Santa Monica Mountains segment). Two tunnel boring machines (TBM) with approximately 45-foot-diameter cutting faces would be used to construct the two tunnel segments underground. For the Westside segment, the TBM would be launched from Staging Area No. 1 in Table 8-4 at Sepulveda Boulevard and National Boulevard. For the Santa Monica Mountains segment, the TBM would be launched from Staging Area No. 4 in the San Fernando Valley. Both TBMs would be extracted from the UCLA Gateway Plaza Station Staging Area No. 3 in Table 8-4. Figure 8-9 shows the location of construction staging locations along the Alternative 4 alignment.

Table 8-4. Alternative 4: On-Site Construction Staging Locations

No.	Location Description
1	Commercial properties on southeast corner of Sepulveda Boulevard and National Boulevard
2	North side of Wilshire Boulevard between Veteran Avenue and Gayley Avenue
3	UCLA Gateway Plaza
4	Residential properties on both sides of Del Gado Drive and south side of Sepulveda Boulevard adjacent to I-405
5	West of Sepulveda Boulevard between Valley Vista Boulevard and Sutton Street
6	West of Sepulveda Boulevard between US-101 and Sherman Oaks Castle Park
7	Lot behind Los Angeles Fire Department Station 88
8	Commercial property on southeast corner of Sepulveda Boulevard and Raymer Street
9	South of the LOSSAN rail corridor east of Van Nuys Metrolink Station, west of Woodman Avenue

Source: STCP, 2024; HTA, 2024

Figure 8-9. Alternative 4: On-Site Construction Staging Locations

Source: STCP, 2024; HTA, 2024

The distance from the surface to the top of the tunnel for the Westside tunnel segment would vary from approximately 40 feet to 90 feet depending on the depth needed to construct the underground stations. The depth of the Santa Monica Mountains tunnel segment would vary from approximately 470 feet as it passes under the Santa Monica Mountains to 50 feet near UCLA. The tunnel segment through the Westside would be excavated in soft ground, while the tunnel through the Santa Monica Mountains would be excavated primarily in hard ground or rock as geotechnical conditions transition from soft to hard ground near the UCLA Gateway Plaza Station.

The aerial guideway viaduct would be primarily situated in the center of Sepulveda Boulevard in the San Fernando Valley, with guideway columns located in both the center and outside of the right-of-way of Sepulveda Boulevard. This would result in a linear work zone spanning the full width of Sepulveda Boulevard along the length of the aerial guideway. Three to five main phases would be required to construct the aerial guideway. A phased approach would allow travel lanes along Sepulveda Boulevard to remain open as construction individually occupies either the center, left, or right side of the roadway via the use of lateral lane shifts. Additional lane closures on side streets may be required along with appropriate detour routing.

The aerial guideway would comprise a mix of simple spans and longer balanced cantilever spans ranging from 80 to 250 feet in length. The repetitive simple spans would be utilized when guideway bent is located within the center median of Sepulveda Boulevard and would be constructed using Accelerated Bridge Construction (ABC) segmental span-by-span technology. Longer balanced cantilever spans would be provided at locations such as freeways, arterials, or street crossings, and would be constructed using ABC segmental balance cantilever technology. Foundations would consist of cast-in-drilled-hole (CIDH) shafts with both precast and cast-in-place structural elements. During construction of the aerial guideway, multiple crews would work on components of the guideway simultaneously.

Construction work zones would also be co-located with future MSF and station locations. All work zones would comprise the permanent facility footprint with additional temporary construction easements from adjoining properties.

The Metro E Line, Santa Monica Boulevard, Wilshire Boulevard/Metro D Line, and UCLA Gateway Plaza Stations would be constructed using a “cut-and-cover” method whereby the station structure would be constructed within a trench excavated from the surface with a portion or all being covered by a temporary deck and backfilled during the later stages of station construction. Traffic and pedestrian detours would be necessary during underground station excavation until decking is in place and the appropriate safety measures are taken to resume cross traffic. Constructing the Ventura Boulevard/Sepulveda Boulevard, Metro G Line Sepulveda, Sherman Way, and Van Nuys Metrolink Stations would include construction of CIDH elevated viaduct with two parallel side platforms supported by outrigger bents.

In addition to work zones, Alternative 4 would require construction staging and laydown areas at multiple locations along the alignment as well as off-site staging areas. Construction staging areas would provide the necessary space for the following activities:

- Contractors’ equipment
- Receiving deliveries
- Testing of soils for minerals or hazards
- Storing materials
- Site offices
- Work zone for excavation
- Other construction activities (including parking and change facilities for workers, location of construction office trailers, storage, staging and delivery of construction materials and permanent plant equipment, and maintenance of construction equipment)

A larger, off-site staging area would be used for temporary storage of excavated material from both tunneling and station cut-and-cover excavation activities. Table 8-4 and Figure 8-9 present potential construction staging areas along the alignment for Alternative 4. Table 8-5 and Figure 8-10 present candidate sites for off-site staging and laydown areas.

Table 8-5. Alternative 4: Potential Off-Site Construction Staging Locations

No.	Location Description
S1	East of Santa Monica Airport Runway
S2	Ralph's Parking Lot in Westwood Village
N1	West of Sepulveda Basin Sports Complex, south of the Los Angeles River
N2	West of Sepulveda Basin Sports Complex, north of the Los Angeles River
N3	Metro G Line Sepulveda Station Park & Ride Lot
N4	North of Roscoe Boulevard and Hayvenhurst Avenue
N5	LADWP property south of the LOSSAN rail corridor, east of Van Nuys Metrolink Station

Source: STCP, 2024; HTA, 2024

Figure 8-10. Alternative 4: Potential Off-Site Construction Staging Locations

Source: STCP, 2024; HTA, 2024

Construction of the HRT guideway between the Van Nuys Metrolink Station and the MSF would require reconfiguration of an existing rail spur serving LADWP property. The new location of the rail spur would require modification to the existing pedestrian undercrossing at the Van Nuys Metrolink Station.

Alternative 4 would require construction of a concrete casting facility for tunnel lining segments because no existing commercial fabricator capable of producing tunnel lining segments for a large-diameter tunnel exists within a practical distance of the Project Study Area. The site of the MSF would initially be

used for this casting facility. The casting facility would include casting beds and associated casting equipment, storage areas for cement and aggregate, and a field quality control facility, which would need to be constructed on-site. When a more detailed design of the facility is completed, the contractor would obtain all permits and approvals necessary from the City of Los Angeles, the South Coast Air Quality Management District, and other regulatory entities.

As areas of the MSF site begin to become available following completion of pre-casting operations, construction of permanent facilities for the MSF would begin, including construction of surface buildings such as maintenance shops, administrative offices, train control, traction power and systems facilities. Some of the yard storage track would also be constructed at this time to allow delivery and inspection of passenger vehicles that would be fabricated elsewhere. Additional activities occurring at the MSF during the final phase of construction would include staging of trackwork and welding of guideway rail.

8.2 Existing Conditions

8.2.1 Population, Housing, and Employment Trends

Alternative 4 is within the jurisdictions of the City of Los Angeles, the City of Santa Monica, and the Sawtelle VA community of Los Angeles County. Affected communities identified within the City of Los Angeles include Bel Air, Encino, Mar Vista, North Sherman Oaks, Palms, Panorama City, Van Nuys, West Los Angeles, and Westwood.

For purposes of the economic and fiscal effects analysis, Alternative 4 would include Transportation Analysis Zones (TAZ) from the Southern California Association of Governments' (SCAG) regional growth forecast and census tracts that intersect the areas within a 0.5-mile radius of the Alternative 4 proposed stations.

Population projections for Alternative 4 show a total increase of 13.5 percent from 2019 to 2045, with notable growth around Wilshire Boulevard/Metro D Line Station (23.9 percent) and Metro E Line Expo/Sepulveda Station (23.8 percent). Table 8-6 includes detailed numbers for population projections within the Alternative 4 TAZs. These projections underscore the need for expanded transit infrastructure to support the rising population, improve regional connectivity, and accommodate future urban development.

Table 8-6. Alternative 4: Future Population Growth

Area[a]	Population 2019	Population 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (U)	15,572	19,285	23.8	0.83
Santa Monica Boulevard Station (U)	24,360	29,180	19.8	0.70
Wilshire Boulevard/Metro D Line Station (U)	25,311	31,369	23.9	0.83
UCLA Gateway Plaza Station (U)	32,773	39,049	19.1	0.68
Ventura Boulevard/Sepulveda Boulevard Station (A)	15,836	17,714	11.9	0.43
Metro G Line Sepulveda Station (A)	12,659	13,773	8.8	0.32
Sherman Way Station (A)	25,408	26,925	6.0	0.22
Van Nuys Metrolink Station (A)	25,138	26,151	4.0	0.15
Total[b]	**150,921**	**171,241**	**13.5**	**0.49**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 4 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

The household growth data for areas along the proposed HRT route in Alternative 4 shows a substantial increase by 2045 (Table 8-7). Notably, the Metro E Line Expo/Sepulveda Station area is projected to experience a 41.6 percent rise in households, while the UCLA Gateway Plaza Station area anticipates a 44.7 percent increase. The total projected household growth across all areas is 31.7 percent. The data reflects an overall trend toward increased residential density in these areas, suggesting a growing demand for housing and associated services.

Table 8-7. Alternative 4: Future Household Growth

Area[a]	Households 2019	Households 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (U)	6,734	9,536	41.6	1.35
Santa Monica Boulevard Station (U)	11,499	15,266	32.8	1.10
Wilshire Boulevard/Metro D Line Station (U)	9,919	13,955	40.7	1.32
UCLA Gateway Plaza Station (U)	7,530	10,899	44.7	1.43
Ventura Boulevard/Sepulveda Boulevard Station (A)	6,878	8,741	27.1	0.93
Metro G Line Sepulveda Station (A)	4,818	6,092	26.4	0.91
Sherman Way Station (A)	9,225	11,386	23.4	0.81
Van Nuys Metrolink Station (A)	7,469	9,379	25.6	0.88
Total[b]	**53,990**	**71,083**	**31.7**	**1.06**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 4 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

The employment data for areas along the proposed HRT route in Alternative 4 shows a projected overall increase of 6.9 percent between 2019 and 2045 (Table 8-8). Notable employment growth is expected around the Santa Monica Boulevard Station, with a 11.6 percent increase, and the Sherman Way Station, which anticipates a 9.7 percent rise. In contrast, the UCLA Gateway Plaza Station area has a more modest growth projection of 4.1 percent. These figures highlight regional economic expansion and the potential need for enhanced public transit to support growing employment hubs and improve commuter accessibility. Major employers and industries in the region include UCLA, UCLA Medical Center, Van Nuys Airport aviation support services, entertainment companies, and healthcare services. Under Alternative 4, job growth would likely put additional strain on the existing transportation system, increasing congestion and travel times. Detailed employment counts for the relevant TAZs are included in Table 8-7.

Table 8-8. Alternative 4: Future Employment Growth

Area[a]	Employment 2019	Employment 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (U)	21,331	22,870	7.2	0.27
Santa Monica Boulevard Station (U)	35,256	39,358	11.6	0.42
Wilshire Boulevard/Metro D Line Station (U)	50,112	53,749	7.3	0.27
UCLA Gateway Plaza Station (U)	68,892	71,688	4.1	0.15
Ventura Boulevard/Sepulveda Boulevard Station (A)	18,449	19,492	5.7	0.21
Metro G Line Sepulveda Station (A)	8,368	9,030	7.9	0.29
Sherman Way Station (A)	10,272	11,271	9.7	0.36
Van Nuys Metrolink Station (A)	10,509	11,497	9.4	0.35
Total[b]	**169,269**	**180,906**	**6.9**	**0.26**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 4 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

8.2.2 Fiscal Trends

The State of California has enjoyed healthy tax revenue growth for the previous decade. Table 8-9 illustrates the State of California tax revenue for the years 2016, 2020, and 2022, with data sourced from the Federal Reserve Bank of St. Louis (2024). It shows a meaningful increase in both individual income tax and general sales and gross receipts tax from 2016-2022. Specifically, individual income tax revenue rose from $80,753 million in 2016 to $146,190 million in 2022. Similarly, general sales and gross receipts tax revenue increased from $39,189 million in 2016 to $52,228 million in 2022. This data highlights the substantial growth in the State of California's tax revenue from 2016 through 2022. Although it is unlikely that tax revenues will continue to grow at the rapid rate seen between 2020 and 2022, it is likely that tax revenue will continue to grow as the State of California's economy expands.

Table 8-9. Alternative 4: State of California Tax Revenue

Tax Revenue	2016 ($M)	2020 ($M)	2022 ($M)
Individual Income Tax	80,753	84,412	146,190
General Sales and Gross Receipts Tax	39,189	43,650	52,228

Source: Federal Reserve Bank of St. Louis, 2024.

$M = millions of dollars

The City of Los Angeles has also experienced significant tax revenue growth during the previous decade. Table 5-5 includes property tax, sales tax, and general fund revenue for the City of Los Angeles for fiscal years (FY) 2016, 2020, and 2023. Property tax rose from $1,708 million in FY 2016 to $2,563 million in FY 2023, sales tax revenue rose from $438 million to $714 million over the same period, and the General Fund revenue for the City of Los Angeles rose from $4,893 million to $7,582 million.

Table 8-10. Alternative 4: City of Los Angeles Tax Revenue

Tax Revenue	2016 ($M)	FY 2020 ($M)	FY 2023 ($M)
Total Property Tax	1,708	2,261	2,563
Sales Tax	438	525	714
Total General Fund Revenue	4,893	7,009	7,582

Source: Controller's Office, City of Los Angeles, 2017, 2021, 2024

8.3 Environmental Impacts

Alternative 4 is expected to enhance economic development in the Los Angeles region by improving connectivity between the San Fernando Valley and the Westside of Los Angeles. This high-capacity rail transit alternative would provide efficient and reliable transportation for a large and growing travel market currently dependent on the congested Sepulveda Pass and nearby canyon roads.

One of the primary benefits of Alternative 4 would be the improved access it would provide to major employment, educational, and cultural centers in the greater Los Angeles area. By linking the Van Nuys Metrolink/Amtrak Station and the Metro East San Fernando Valley Light Rail Transit Line at the north end, and the Metro G Line, Metro D Line, and the Metro E Line at the south end, Alternative 4 would facilitate smoother and faster commutes and reduce travel times compared to automobile travel along regularly congested I-405. This enhanced connectivity is expected to attract businesses and workers, which would foster a more dynamic and integrated regional economy. The convenience of rapid transit access would likely stimulate real estate development and boost property values along the Sepulveda Transit Corridor.

Throughout the construction period and the operations period, Alternative 4 is anticipated to increase employment for the region. Jobs would range from construction and engineering roles to ongoing operational and maintenance positions, which would provide a healthy boost to local employment. Additionally, Alternative 4 would contribute to the long-term resiliency of the City of Los Angeles. By diversifying transportation options and reducing reliance on automobiles, the region would be better positioned to withstand economic shocks related to fuel price volatility or disruptions in road networks.

8.3.1 Construction Output, Earnings, and Employment

Construction of Alternative 4 would require substantial capital investment in the Los Angeles Metropolitan Statistical Area (MSA). The necessary spending would increase the employment, earnings, and output for the duration of the construction period. Capital cost estimates are in 2023 dollars, providing a common value for expenditures that would be distributed over several years. The following section describes the Alternative 4 expenditures and anticipated economic effects.

Capital expenditures for Alternative 4 are estimated at $17,444 million (2023 dollars). The breakdown of capital expenditures by category is shown in Table 8-11. Capital expenditures exclude ROW costs because purchasing ROW is not anticipated to support job creation. Acquiring and selling a property is a transfer of asset between entities, and there is no economic activity associated with it, except for small real estate/bank fees.

Table 8-11. Alternative 4: Summary of Capital Costs

Category	2023 ($M)
Design and Planning	4,174
Construction	12,661
Equipment	610
Total*	**17,444**

Source: Metro, 2024b

*Sum may not equal total due to rounding.
$M = millions of dollars
Note: Capital cost estimates are exclusive of right-of-way acquisition costs

To isolate the potential economic effects of Alternative 4 on the local economy and the State of California, it is typical to distinguish between resources that are new to the economy — those that would be invested in the Los Angeles-Long Beach-Anaheim MSA and/or the State of California under Alternative 4 — and resources that would be spent in the region with similar economic effects (e.g., funds that would be allocated to other transportation construction projects in the area).

Two considerations determine the capital cost effects:

- Are the expenditures of the type likely to yield effects in the local economy?
- Are the funds used to make those expenditures new resources for the region?

At this stage of Alternative 4 development, the exact breakdown of funding distribution is subject to change. Alternative 4 is expected to be funded by a variety of local, state, and federal sources, including Measure M, which is a Los Angeles County, voter-approved, no-sunset, half-cent sales tax that funds projects to ease traffic, expand public transportation, and more (Metro, 2016). Measure M partially funds many Metro projects (Metro, 2016. For this analysis, 100 percent of Alternative 4 costs are treated as new funding to the region. This assumption yields an upper-limit estimate of economic output due to Alternative 4 construction. The actual effects of post construction would likely be lower, once expenditures planned under the No Project Alternative, such as the Measure M funds, are removed. The Regional Input-Output Modeling System (RIMS II) analysis can be updated to reflect more accurate outputs after more detailed funding allocations become available. Equipment for Alternative 4 is expected to be sourced from outside the State of California. Therefore, the equipment cost category is not factored into the effect analysis.

Each dollar of new resources is expected to yield an economic effect. Table 8-12 provides the multiplier values for the industry categories by geographic area.

Table 8-12. Alternative 4: Comparison of Regional Input-Output Modeling System Multipliers for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Industry	Final Demand Multiplier			Direct Effect	
		Output ($)	Earnings ($)	Employment	Earnings ($)	Employment
Los Angeles-Long Beach-Anaheim MSA	Design and Planning	2.0752	0.7202	9.638	1.7681	2.2741
	Construction (Tunnel, Track and Approaches)	1.882	0.4868	7.1079	1.8935	2.1094
State of California	Design and Planning	2.1309	0.7867	10.6262	1.8193	2.3616
	Construction (Tunnel, Track and Approaches)	1.9668	0.5812	8.5522	1.8995	2.1325

Source: BEA, 2024

$ = dollars

Using the construction industry as an example, the multipliers in Table 8-12 are interpreted as follows:

- The Final Demand Output Multiplier represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Employment Multiplier represents the total change in number of jobs that occurs in all industries for each $1 million of output delivered to final demand by the construction industry.
- The Direct Effect Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the construction industry.
- The Direct Effect Employment Multiplier represents the total change in number of jobs in all industries for each additional job in the construction industry.

Applying the Final Demand Multipliers for the construction industry to the amount of funding/resources allocated for capital expenditures provides estimates of the net output, earnings, and employment effects generated by Alternative 4 in each region. The results are summarized in Table 8-13 and Table 8-14. It is important to note that these effects are one-time effects lasting for the duration of Alternative 4 construction. One job is defined as a job for one person with a duration of one year. For example, a job for one person lasting three years would be defined as three person-year jobs.

It is noteworthy that the economic effects at the MSA level and at the state level are not additive. The economic effects at the MSA level assume that the Alternative 4 costs, with the exception of vehicle costs which were removed, would be incurred entirely in the Los Angeles-Long Beach-Anaheim MSA. Likewise, the economic effects at the state level assume that the Alternative 4 costs, also with the exception of vehicle costs, would be incurred entirely in the State of California. As previously discussed in Section 3.2.1.4, this is a high estimate because 100 percent of funding is assumed to be new to the region. Similarly, the State of California outputs assume that all Alternative 4 costs would be new funding within the state. Table 8-13 and Table 8-14 outline two separate scenarios and illustrate the maximum economic benefits achievable from each one. For example, Alternative 4 would not generate

126,200 person-years of employment within the MSA (Table 8-13) and 147,900 within the State of California (Table 8-14) simultaneously; these two values should be considered individually.

Table 8-13. Alternative 4: Net Effects of Capital Expenditure on the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Year Jobs)
Design and Planning	4,174	2.0752	0.7202	9.638	8,661	3,006	38,987
Construction (Tunnel, Track and Approaches)	12,661	1.882	0.4868	7.1079	23,828	6,163	87,224
Total	**16,835**				**32,489**	**9,169**	**126,211**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For Los Angeles-Long Beach-Anaheim MSA, the construction spending for Alternative 4 is expected to generate $23,828 million in output (in 2023 dollars), $6,163 million in earnings, and over 87,200 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $8,661 million, earnings of $3,006 million, and employment of over 38,900 person-year jobs.

Table 8-14. Alternative 4: Net Effects of Capital Expenditure on the State of California

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Year Jobs)
Design and Planning	4,174	2.1309	0.7867	10.6262	8,894	3,283	42,984
Construction (Tunnel, Track and Approaches)	12,661	1.9668	0.5812	8.5522	24,902	7,359	104,948
Total	**16,835**				**33,795**	**10,642**	**147,932**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the State of California, the construction spending for Alternative 4 is expected to generate $24,902 million in output (in 2023 dollars), $7,359 million in earnings, and nearly 105,000 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $8,894 million, earnings of $3,283 million, and employment of nearly 43,000 person-year jobs.

8.3.2 Operational Output, Earnings, and Employment

Alternative 4 is expected to generate reoccurring employment and earnings for the region in the form of operation and maintenance staff, facility operators, and maintenance expenditures. The operations and maintenance (O&M) expenditures for Alternative 4 are expected to have a beneficial, but not substantial effect on local employment, relative to the overall employment of the region.

8.3.3 Fiscal Effects

The wages generated from Alternative 4 would boost tax revenues at the state and county levels. The middle-income tax bracket rate of 9.3 percent was chosen for the analysis, as it covers the widest range

of middle-income households (Table 8-15), those with an annual income between $68,350 and $349,137. Due to possible spillage into other income tax brackets and accounting for the limitations of this methodology, the final income and sales tax revenue generated from Alternative 4 should be considered estimates. The assumed 9.3 percent tax rate is an upper-limit estimate. The effective tax rate would be lower than 9.3 percent due to the first $68,350 of household income being taxed at the lower tax bracket. Sales tax rates for the State of California and Los Angeles County are provided in Table 8-16.

Table 8-15. Alternative 4: State of California Income Tax Rates

Income Bracket	Income Tax Rate
$0 - $10,412	1.00%
$10,412 - $24,684	2.00%
$24,684 - $38,959	4.00%
$38,959 - $54,081	6.00%
$54,081 - $68,350	8.00%
$68,350 - $349,137	9.30%
$349,137 - $418,961	10.30%
$418,961 - $698,271	11.30%
> $698,271	12.30%

Source: California Franchise Tax Board, 2023

Table 8-16. Alternative 4: Sales Tax Rates for the State of California and Los Angeles County

Region	Sales Tax Rate
State of California	7.25%
Los Angeles County	9.50%

Source: California Department of Tax and Fee Administration, 2024

8.3.3.1 Income Tax Revenue

To calculate the additional income tax earnings for the State of California, the median income tax rate of 9.3 percent was used. For the Los Angeles-Long Beach-Anaheim MSA, the average income tax rate for the area was applied to the earnings generated within the MSA.

Table 8-17 shows the additional income tax generated to the MSA and the state under Alternative 4. The Los Angeles-Long Beach-Anaheim MSA would generate additional income tax revenue of $853 million. The State of California would generate additional income tax revenue of $990 million. As discussed earlier in Section 8.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 8-17. Alternative 4: Additional Income Tax Generated Earnings for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings (2023 $M)	Income Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	9,169	853
State of California	10,642	990

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

8.3.3.2 Sales Tax Revenue

The incremental consumption from new earnings would also boost sale tax revenues for the MSA and state. To estimate the potential increase in sales tax, calculations should account for the portion of consumption subject to sales tax and income tax deductions, as follows:

- Consumption expenditure subject to sales tax requires the identification of the share of the consumption basket that is taxable. The categories included in the analysis represent the typical expenditure for a household in the State of California. Taxable expenditures include food away from home, alcoholic beverages, apparel and services, transportation, entertainment, and personal care products. For the state, around 29 percent of consumption expenditure is subject to sales tax (U.S. Bureau of Labor Statistics, 2020). The 29 percent value is applied to both the MSA and State of California earnings to generate the expected sales tax revenue increase. A breakdown of California household annual taxable expenditures is available in Table 8-18. Household expenditures are based on the U.S. Bureau of Labor Statistics calculated average of 2.7 individuals per California household.
- After-tax earnings exclude income tax from gross earnings, as identified in Table 8-19.

Table 8-18. Alternative 4: Average Household Annual Taxable Expenditures in the State of California, 2019-2020

Category	Expenditure Means
Food away from home	$3,596.47
Alcoholic beverages	$666.20
Apparel and services	$1,738.69
Transportation	$10,499.82
Entertainment	$3,134.81
Personal care products	$813.00
Total	**$20,448.99**
Average annual expenditures	$70,830.25
Annual expenditures subject to sales tax	**29%**

Source: U.S. Bureau of Labor Statistics, 2020

Table 8-19 provides the additional sales tax generated from the MSA and the state under Alternative 4. The MSA and State of California would generate sales tax earnings of $229 million and $202 million, respectively. As discussed earlier in Section 8.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 8-19. Alternative 4: Sales Tax Revenues Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings after Income Tax Deductions (2023 $M)[a]	Taxable Consumption Expenditure (2023 $M)[b]	Sales Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	8,317	2,412	229
State of California	9,652	2,799	202

Source: BEA, 2024; Metro, 2024b

[a]This is equal to the total consumption expenditure.
[b]Figured at 29 percent of total consumption expenditure.

2023 $M = millions in 2023 dollars

8.3.3.3 Property Tax Revenue

To construct Alternative 4, it would be necessary to acquire private land and structures for easements, ROWs, parking, and station facilities. These acquisitions would remove the properties from the local tax base, which would reduce annual tax revenue.

Including temporary takes during construction and applying a conservative assumption that both partial and full takes would result in property tax loss for the full parcel, it is estimated that less than 0.21 percent of the Los Angeles County or City of Los Angeles annual property tax revenue would be impacted relative to 2023 assessed parcel values and the total 2023 property tax revenues (County of Los Angeles, 2023; Controller's Office, City of Los Angeles, 2024). The calculated revenue loss would be well below the annual change in levied taxes, which increased 5.5 percent in fiscal year 2022-2023 from fiscal year 2022-2023 (County of Los Angeles, 2023). The projected loss in tax revenues associated with Alternative 4 would not compromise the county's or city's ability to provide services or generate an adverse effect.

Additionally, proximity to public transit can increase property values in both residential and commercial real estate markets (APTA, 2019), potentially offsetting property tax loss from parcel acquisition. For example, between 2012 and 2016, residential property values near transit areas increased by 61 percent, 8 percentage points more than in non-transit areas. Commercial properties near transit performed better than other commercial properties in the region, with a 73 percent increase in property value in the transit areas versus 58 percent in the region.

8.4 Mitigation Measures

8.4.1 Construction Effects

Table 8-20 shows the additional annual employment generated in the short term would be 0.24 percent of existing employment in Los Angeles-Long Beach-Anaheim MSA and 0.10 percent of existing employment in the State of California. Additionally, the employment generated as a result of Alternative 4 would be distributed throughout the construction life of Alternative 4. The over 126,200 person-year jobs would not occur within the same year, smoothing the effects of Alternative 4-related employment further. Assuming an 8¼ year construction timeline for Alternative 4, the alternative is projected to generate an additional 15,200 jobs annually within the MSA. Additional employment generated from Alternative 4 would be a relatively small increase in overall employment and would have a beneficial effect on the local economy. Therefore, no mitigation measures are required.

Table 8-20. Alternative 4: Employment Effects Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Short-Term Employment Generated (Person-Year Jobs)	Jobs Created Annually (8¼ year construction schedule)	Existing Employment[a] (2024)	Short-Term Employment Generated[b]
Los Angeles-Long Beach-Anaheim MSA	126,211	15,298	6,346,100	0.24%
State of California	147,932	17,931	18,104,800	0.10%

Source: U.S. Bureau of Labor Statistics, 2025a, 2025b

[a]October 2024 Total Nonfarm, Not Seasonally Adjusted
[b]Jobs Created Annually/Employment

8.4.2 Operational Effects

Annual O&M costs would be a fraction of the construction costs, which would require no mitigation measures. Therefore, there will also be no mitigation measures required for operational effects.

8.4.3 Impacts After Mitigation

No mitigation measures are required; impacts are less than significant.

9 ALTERNATIVE 5

9.1 Alternative Description

Alternative 5 consists of a heavy rail transit (HRT) system with a primarily underground guideway track configuration, including seven underground stations and one aerial station. This alternative would include five transfers to high-frequency fixed guideway transit and commuter rail lines, including the Los Angeles County Metropolitan Transportation Authority's (Metro) E, Metro D, and Metro G Lines, East San Fernando Valley Light Rail Transit Line, and the Metrolink Ventura County Line. The length of the alignment between the terminus stations would be approximately 13.8 miles, with 0.7 miles of aerial guideway and 13.1 miles of underground configuration.

The seven underground and one aerial HRT stations would be as follows:

1. Metro E Line Expo/Sepulveda Station (underground)
2. Santa Monica Boulevard Station (underground)
3. Wilshire Boulevard/Metro D Line Station (underground)
4. UCLA Gateway Plaza Station (underground)
5. Ventura Boulevard/Sepulveda Boulevard Station (underground)
6. Metro G Line Sepulveda Station (underground)
7. Sherman Way Station (underground)
8. Van Nuys Metrolink Station (aerial)

9.1.1 Operating Characteristics

9.1.1.1 Alignment

As shown on Figure 9-1, from its southern terminus station at the Metro E Line Expo/Sepulveda Station, the alignment of Alternative 5 would run underground north through the Westside of Los Angeles (Westside), the Santa Monica Mountains, and the San Fernando Valley (Valley) to a tunnel portal east of Sepulveda Boulevard and south of Raymer Street. As it approaches the tunnel portal, the alignment would curve eastward and begin to transition to an aerial guideway along the south side of the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor that would continue to the northern terminus station adjacent to the Van Nuys Metrolink/Amtrak Station.

The proposed southern terminus station would be located underground east of Sepulveda Boulevard between the existing elevated Metro E Line tracks and Pico Boulevard. Tail tracks for vehicle storage would extend underground south of National Boulevard east of Sepulveda Boulevard. The alignment would continue north beneath Bentley Avenue before curving northwest to an underground station at the southeast corner of Santa Monica Boulevard and Sepulveda Boulevard. From the Santa Monica Boulevard Station, the alignment would continue and curve eastward to the Wilshire Boulevard/Metro D Line Station beneath the Metro D Line Westwood/UCLA Station, which is currently under construction as part of the Metro D Line Extension Project. From there, the underground alignment would curve slightly to the northeast and continue beneath Westwood Boulevard before reaching the UCLA Gateway Plaza Station.

Figure 9-1. Alternative 5: Alignment

Source: STCP, 2024; HTA, 2024

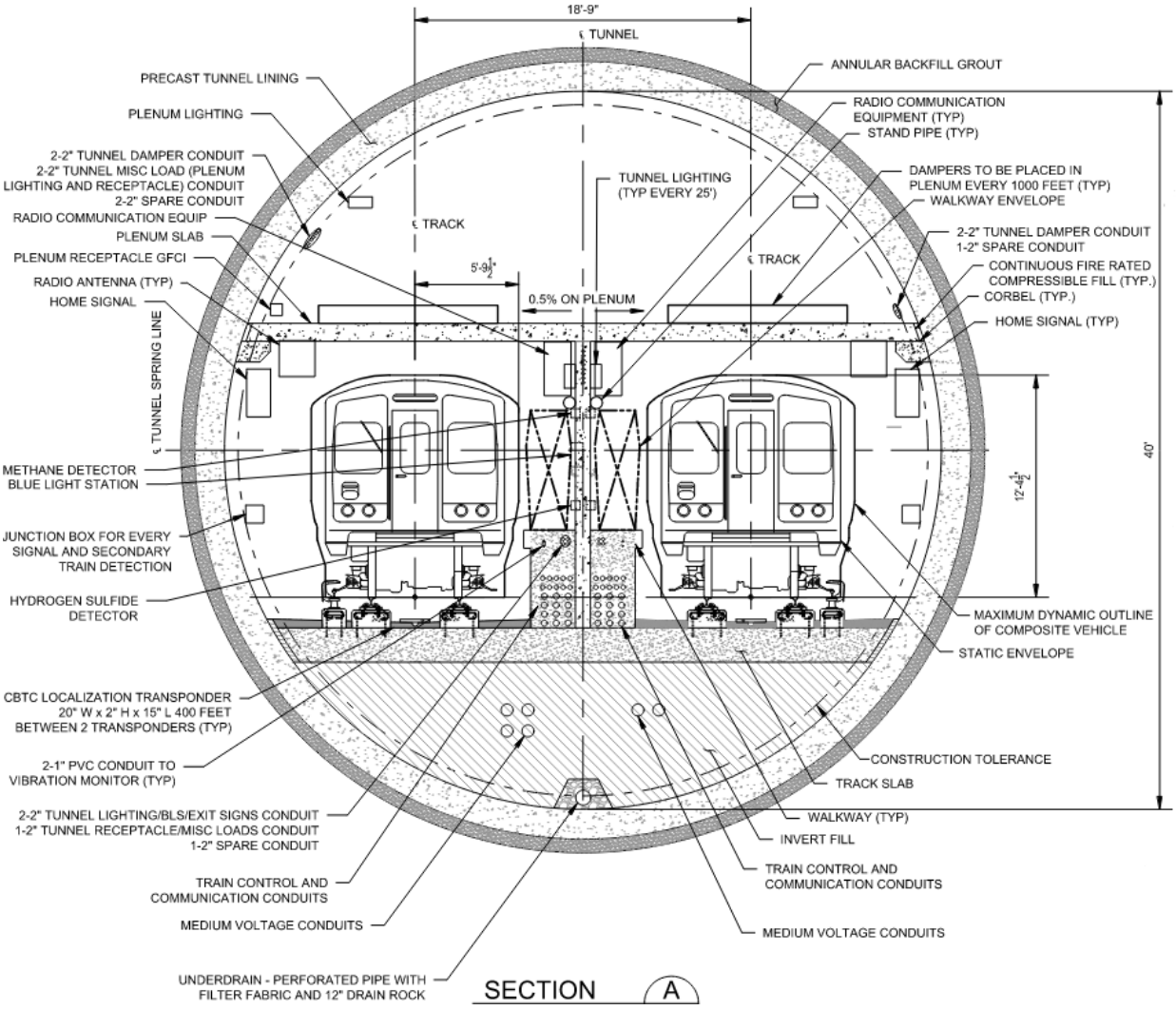
From the UCLA Gateway Plaza Station, the alignment would turn to the northwest beneath the Santa Monica Mountains to the east of Interstate 405 (I-405). South of Mulholland Drive, the alignment would curve to the north, aligning with Saugus Avenue south of Valley Vista Boulevard. The Ventura Boulevard Station would be located under Saugus Avenue between Greenleaf Street and Dickens Street. The alignment would then continue north beneath Sepulveda Boulevard to the Metro G Line Sepulveda Station immediately south of the Metro G Line Busway. After leaving the Metro G Line Sepulveda Station, the alignment would continue beneath Sepulveda Boulevard to reach the Sherman Way Station,

the final underground station along the alignment, immediately south of Sherman Way. From the Sherman Way Station, the alignment would continue north before curving slightly to the northeast to the tunnel portal south of Raymer Street. The alignment would then transition from an underground configuration to an aerial guideway structure after exiting the tunnel portal. East of the tunnel portal, the alignment would transition to a cut-and-cover U-structure segment followed by a trench segment before transitioning to an aerial guideway that would run east along the south side of the LOSSAN rail corridor. Parallel to the LOSSAN rail corridor, the guideway would conflict with the existing Willis Avenue Pedestrian Bridge which would be demolished. The alignment would follow the LOSSAN rail corridor before reaching the proposed northern terminus Van Nuys Metrolink Station located adjacent to the existing Metrolink/Amtrak Station. The tail tracks and yard lead tracks would descend to the proposed at-grade maintenance and storage facility (MSF) east of the proposed northern terminus station. Modifications to the existing pedestrian underpass to the Metrolink platforms to accommodate these tracks would result in reconfiguration of an existing rail spur serving City of Los Angeles Department of Water and Power (LADWP) property.

9.1.1.2 Guideway Characteristics

For underground sections, Alternative 5 would utilize a single-bore tunnel configuration with an outside diameter of approximately 43.5 feet. The tunnel would include two parallel tracks at 18.75-foot spacing in tangent sections separated by a continuous central dividing wall throughout the tunnel. Inner walkways would be constructed adjacent to the two tracks. Inner and outer walkways would be constructed within tunnel sections near the track crossovers. At the crown of tunnel, a dedicated air plenum would be provided by constructing a concrete slab above the railway corridor. The air plenum would allow for ventilation throughout the underground portion of the alignment. Figure 9-2 illustrates these components at a typical cross-section of the underground guideway.

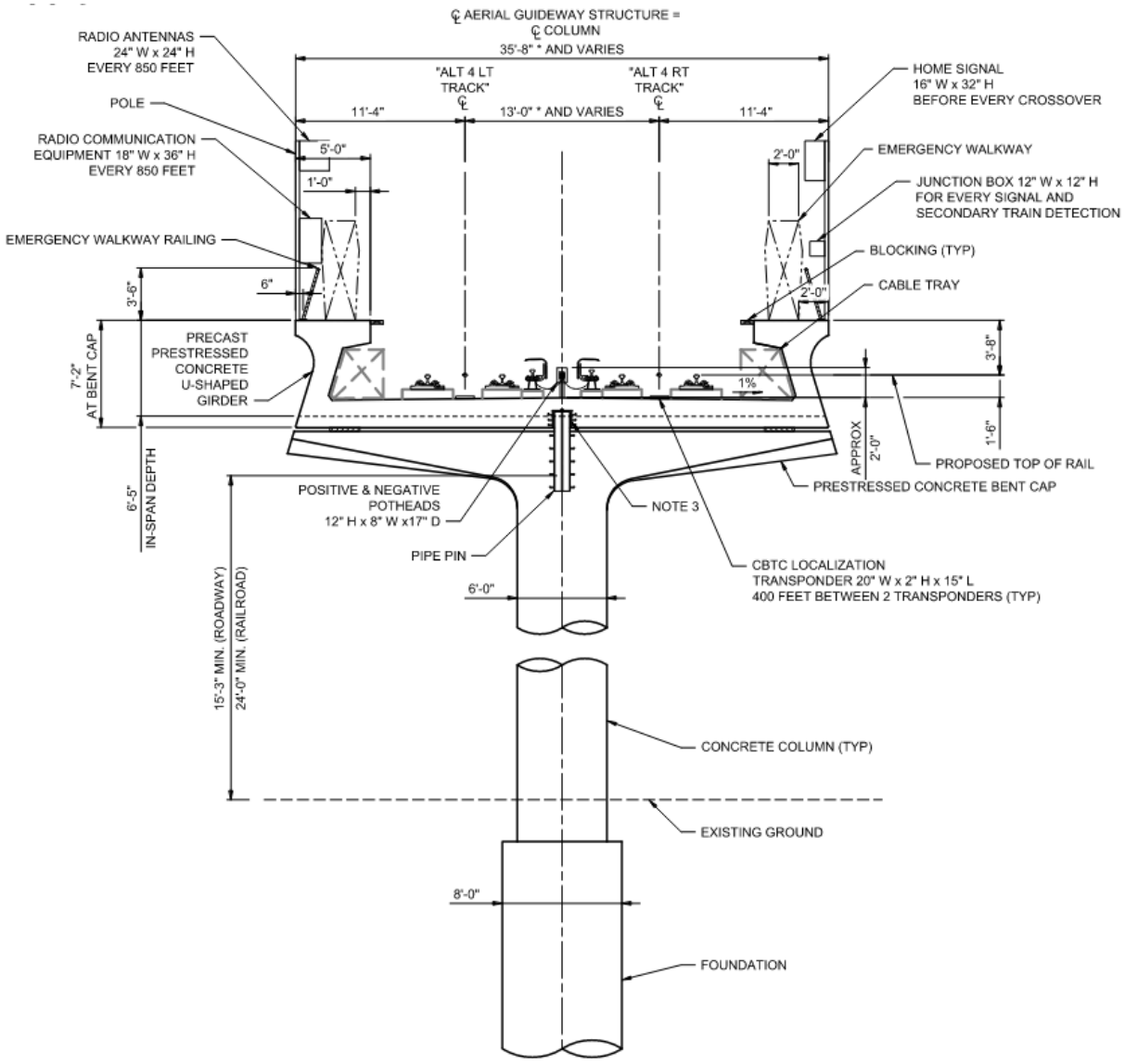
Figure 9-2. Typical Underground Guideway Cross-Section



Source: STCP, 2024

In aerial sections adjacent to Raymer Street and the LOSSAN rail corridor, the guideway would consist of single-column spans. The single-column spans would include a U-shaped concrete girder structure that supports the railway track atop a series of individual columns. The single-column aerial guideway would be approximately 36 feet wide. The track would be constructed on the concrete girders with direct fixation and would maintain a minimum of 13 feet between the two-track centerlines. On the outer side of the tracks, emergency walkways would be constructed with a minimum width of 2 feet. The single-column aerial guideway would be the primary aerial structure throughout the aerial portion of the alignment. Figure 9-3 shows a typical cross-section of the single-column aerial guideway.

Figure 9-3. Typical Aerial Guideway Cross-Section



Source: STCP, 2024

9.1.1.3 Vehicle Technology

Alternative 5 would utilize steel-wheel HRT trains, with automated train operations and planned peak-period headways of 2.5 minutes and off-peak-period headways ranging from 4 to 6 minutes. Each train could consist of three or four cars with open gangways between cars. The HRT vehicle would have a maximum operating speed of 70 miles per hour; actual operating speeds would depend on the design of the guideway and distance between stations. Train cars would be approximately 10 feet wide with three double doors on each side. Each car would be approximately 72 feet long with capacity for 170 passengers. Trains would be powered by a third rail.

9.1.1.4 Stations

Alternative 5 would include seven underground stations and one aerial station with station platforms measuring 280 feet long for both station configurations. The aerial station would be constructed a minimum of 15.25 feet above ground level, supported by rows of dual columns with 8-foot diameters. The southern terminus station would be adjacent to the Metro E Line Expo/Sepulveda Station, and the northern terminus station would be adjacent to the Van Nuys Metrolink/Amtrak Station.

All stations would be side-platform stations where passengers would select and travel up to station platforms depending on their direction of travel. All stations would include 20-foot-wide side platforms separated by 30 feet for side-by-side trains. Each underground station would include an upper and lower concourse level prior to reaching the train platforms. The Van Nuys Metrolink Station would include a mezzanine level prior to reaching the station platforms. Each station would have a minimum of two elevators, two escalators, and one stairway from ground level to the concourse or mezzanine.

Stations would include automatic, bi-parting fixed doors along the edges of station platforms. These platform screen doors would be integrated into the automatic train control system and would not open unless a train is stopped at the platform.

The following information describes each station, with relevant entrance, walkway, and transfer information. Bicycle parking would be provided at each station.

Metro E Line Expo/Sepulveda Station

- This underground station would be located just north of the existing Metro E Line Expo/Sepulveda Station, on the east side of Sepulveda Boulevard.
- A station entrance would be located on the east side of Sepulveda Boulevard north of the Metro E Line.
- A direct internal transfer to the Metro E Line would be provided at street level within the fare paid zone.
- A 126-space parking lot would be located immediately north of the station entrance, east of Sepulveda Boulevard. Passengers would also be able to park at the existing Metro E Line Expo/Sepulveda Station parking facility, which provides 260 parking spaces.

Santa Monica Boulevard Station

- This underground station would be located under the southeast corner of Santa Monica Boulevard and Sepulveda Boulevard.
- The station entrance would be located on the south side of Santa Monica Boulevard between Sepulveda Boulevard and Bentley Avenue.
- No dedicated station parking would be provided at this station.

Wilshire Boulevard/Metro D Line Station

- This underground station would be located beneath the Metro D Line tracks and platform under Gayley Avenue between Wilshire Boulevard and Lindbrook Drive.
- Station entrances would be provided on the northeast corner of Wilshire Boulevard and Gayley Avenue and on the northeast corner of Lindbrook Drive and Gayley Avenue. Passengers would also be able to use the Metro D Line Westwood/UCLA Station entrances to access the station platform.

- A direct internal station transfer to the Metro D Line would be provided at the south end of the station.
- No dedicated station parking would be provided at this station.

UCLA Gateway Plaza Station

- This underground station would be located underneath Gateway Plaza on the University of California, Los Angeles (UCLA) campus.
- Station entrances would be provided on the north side of Gateway Plaza and on the east side of Westwood Boulevard across from Strathmore Place.
- No dedicated station parking would be provided at this station.

Ventura Boulevard/Sepulveda Boulevard Station

- This underground station would be located under Saugus Avenue between Greenleaf Street and Dickens Street.
- A station entrance would be located on the southeast corner of Saugus Avenue and Dickens Street.
- Approximately 92 parking spaces would be supplied at this station west of Sepulveda Boulevard between Dickens Street and the U.S. Highway 101 (US-101) On-Ramp.

Metro G Line Sepulveda Station

- This underground station would be located under Sepulveda Boulevard immediately south of the Metro G Line Busway.
- A station entrance would be provided on the west side of Sepulveda Boulevard south of the Metro G Line Busway.
- Passengers would be able to park at the existing Metro G Line Sepulveda Station parking facility, which has a capacity of 1,205 parking spaces. Currently, only 260 parking spaces are currently used for transit parking. No new parking would be constructed.

Sherman Way Station

- This underground station would be located below Sepulveda Boulevard between Sherman Way and Gault Street.
- The station entrance would be located near the southwest corner of Sepulveda Boulevard and Sherman Way.
- Approximately 122 parking spaces would be supplied at this station on the west side of Sepulveda Boulevard with vehicle access from Sherman Way.

Van Nuys Metrolink Station

- This aerial station would span Van Nuys Boulevard, just south of the LOSSAN rail corridor.
- The primary station entrance would be located on the east side of Van Nuys Boulevard just south of the LOSSAN rail corridor. A secondary station entrance would be located between Raymer Street and Van Nuys Boulevard.
- An underground pedestrian walkway would connect the station plaza to the existing pedestrian underpass to the Metrolink/Amtrak platform outside the fare paid zone.

- Existing Metrolink Station parking would be reconfigured, maintaining approximately the same number of spaces, but 66 parking spaces would be relocated west of Van Nuys Boulevard. Metrolink parking would not be available to Metro transit riders.

9.1.1.5 Station-To-Station Travel Times

Table 9-1 presents the station-to-station distance and travel times at peak period for Alternative 5. The travel times include both run time and dwell time. Dwell time is 30 seconds for transfer stations and 20 seconds for other stations. Northbound and southbound travel times vary slightly because of grade differentials and operational considerations at end-of-line stations.

Table 9-1. Alternative 5: Station-to-Station Travel Times and Station Dwell Times

From Station	To Station	Distance (miles)	Northbound Station-to-Station Travel Time (seconds)	Southbound Station-to-Station Travel Time (seconds)	Dwell Time (seconds)
Metro E Line Station					*30*
Metro E Line	Santa Monica Boulevard	0.9	89	86	—
Santa Monica Boulevard Station					*20*
Santa Monica Boulevard	Wilshire/Metro D Line	0.9	91	92	—
Wilshire/Metro D Line Station					*30*
Wilshire/Metro D Line	UCLA Gateway Plaza	0.7	75	69	—
UCLA Gateway Plaza Station					*20*
UCLA Gateway Plaza	Ventura Boulevard	6.0	368	359	—
Ventura Boulevard Station					*20*
Ventura Boulevard	Metro G Line	2.0	137	138	—
Metro G Line Station					*30*
Metro G Line	Sherman Way	1.4	113	109	—
Sherman Way Station					*20*
Sherman Way	Van Nuys Metrolink	1.9	166	162	—
Van Nuys Metrolink Station					*30*

Source: STCP, 2024

— = no data

9.1.1.6 Special Trackwork

Alternative 5 would include 10 double crossovers throughout the alignment enabling trains to cross over to the parallel track. Each terminus station would include a double crossover immediately north and south of the station. Except for the Santa Monica Boulevard Station, each station would have a double crossover immediately south of the station. The remaining crossover would be located along the alignment midway between the UCLA Gateway Plaza Station and the Ventura Boulevard Station.

9.1.1.7 Maintenance and Storage Facility

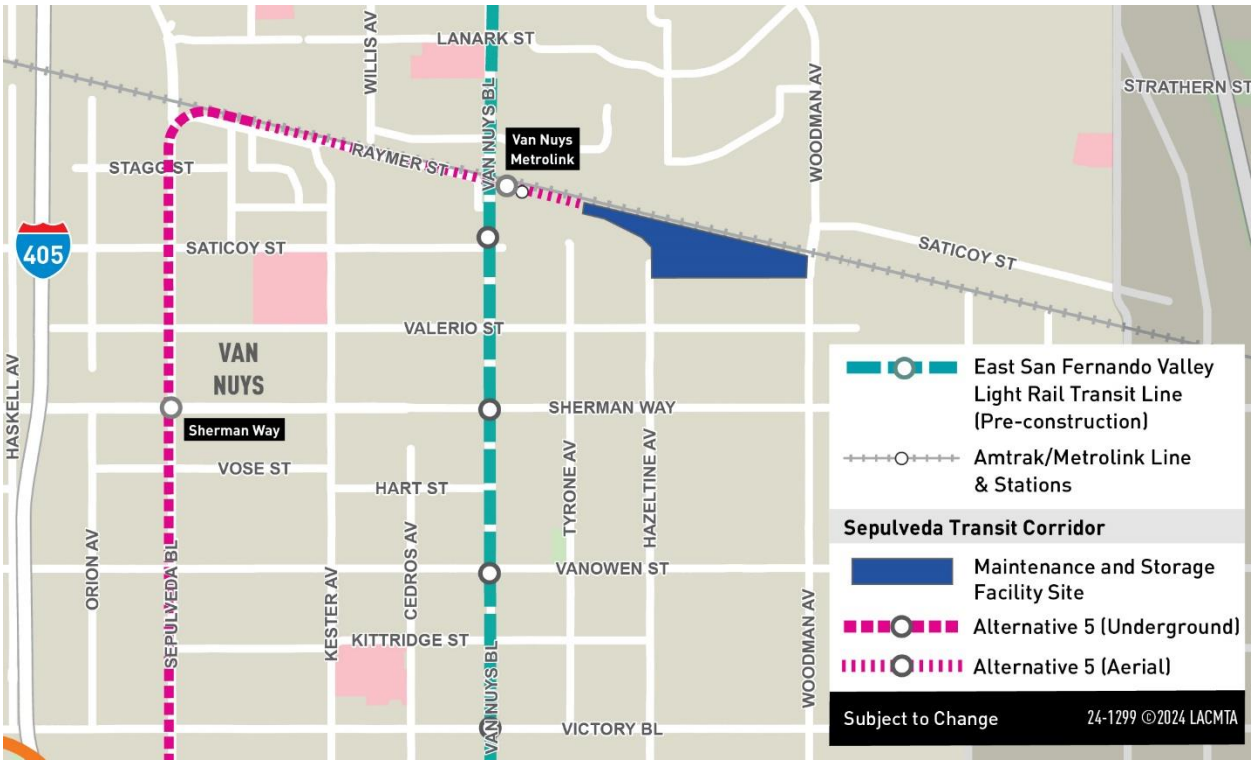
The MSF for Alternative 5 would be located east of the Van Nuys Metrolink Station and would encompass approximately 46 acres. The MSF would be designed to accommodate 184 rail cars and would be bounded by single-family residences to the south, the LOSSAN rail corridor to the north, Woodman Avenue on the east, and Hazeltine Avenue and industrial manufacturing enterprises to the west. Trains would access the site from the fixed guideway's tail tracks at the northwest corner of the site. Trains would then travel southeast to maintenance facilities and storage tracks.

The site would include the following facilities:

- Two entrance gates with guard shacks
- Main shop building
- Maintenance-of-way building
- Storage tracks
- Carwash building
- Cleaning and inspections platforms
- Material storage building
- Hazmat storage locker
- Traction power substation (TPSS) located on the west end of the MSF to serve the mainline
- TPSS located on the east end of the MSF to serve the yard and shops
- Parking area for employees
- Grade separated access roadway (over the HRT tracks at the east end of the facility) and necessary drainage

Figure 9-4 shows the location of the MSF site for Alternative 5.

Figure 9-4. Alternative 5: Maintenance and Storage Facility Site



Source: STCP, 2024; HTA, 2024

9.1.1.8 Traction Power Substations

TPSSs transform and convert high voltage alternating current supplied from power utility feeders into direct current suitable for transit operation. Twelve TPSS facilities would be located along the alignment and would be spaced approximately 0.5 to 2.5 miles apart. All TPSS facilities would be located within the

stations, adjacent to the tunnel through the Santa Monica Mountains, or within the MSF. Table 9-2 lists the TPSS locations for Alternative 5.

Figure 9-5 shows the TPSS locations along the Alternative 5 alignment

Table 9-2. Alternative 5: Traction Power Substation Locations

TPSS No.	TPSS Location Description	Configuration
1	TPSS 1 would be located east of Sepulveda Boulevard and north of the Metro E Line.	Underground (within station)
2	TPSS 2 would be located south of Santa Monica Boulevard between Sepulveda Boulevard and Bentley Avenue.	Underground (within station)
3	TPSS 3 would be located at the southeast corner of UCLA Gateway Plaza.	Underground (within station)
4	TPSS 4 would be located south of Bellagio Road and west of Stone Canyon Road.	Underground (adjacent to tunnel)
5	TPSS 5 would be located west of Roscomare Road between Donella Circle and Linda Flora Drive.	Underground (adjacent to tunnel)
6	TPSS 6 would be located east of Loom Place between Longbow Drive and Vista Haven Road.	Underground (adjacent to tunnel)
7	TPSS 7 would be located west of Sepulveda Boulevard between the I-405 Northbound On-Ramp and Dickens Street.	Underground (within station)
8	TPSS 8 would be located west of Sepulveda Boulevard between the Metro G Line Busway and Oxnard Street.	Underground (within station)
9	TPSS 9 would be located at the southwest corner of Sepulveda Boulevard and Sherman Way.	Underground (within station)
10	TPSS 10 would be located south of the LOSSAN rail corridor and north of Raymer Street and Kester Avenue.	At-grade
11	TPSS 11 would be located south of the LOSSAN rail corridor and east of the Van Nuys Metrolink Station.	At-grade (within MSF)
12	TPSS 12 would be located south of the LOSSAN rail corridor and east of Hazeltine Avenue.	At-grade (within MSF)

Source: STCP, 2024; HTA, 2024

Note: Sepulveda Transit Corridor Partners (STCP) has stated that Alternative 5 TPSS locations are derived from and assumed to be similar to the Alternative 4 TPSS locations.

Figure 9-5. Alternative 5: Traction Power Substation Locations

Source: STCP, 2024; HTA, 2024

9.1.1.9 Roadway Configuration Changes

Table 9-3 lists the roadway changes necessary to accommodate the guideway of Alternative 5. Figure 9-6 shows the location of the roadway changes within the Alternative 5 Study Area. In addition to the changes made to accommodate the guideway, as listed in Table 9-3, roadways and sidewalks near stations would be reconstructed, resulting in modifications to curb ramps and driveways.

Table 9-3. Alternative 5: Roadway Changes

Location	From	To	Description of Change
Raymer Street	Kester Avenue	Keswick Street	Reconstruction resulting in narrowing of width and removal of parking on the westbound side of the street to accommodate aerial guideway columns.
Cabrito Road	Raymer Street	Marson Street	Closure of Cabrito Road and the LOSSAN rail corridor at-grade crossing. A new segment of Cabrito Road would be constructed from Noble Avenue and Marson Street to provide access to extra space storage from the north.

Source: STCP, 2024; HTA, 2024

Figure 9-6. Alternative 5: Roadway Changes

Source: STCP, 2024; HTA, 2024

9.1.1.10 Ventilation Facilities

For ventilation, a plenum within the crown of the tunnel would provide a separate compartment for air circulation and allow multiple trains to operate between stations. Each underground station would include a fan room with additional ventilation facilities. Alternative 5 would also include a stand-alone ventilation facility at the tunnel portal on the northern end of the tunnel segment, located east of Sepulveda Boulevard and south of Raymer Street. Within this facility, ventilation fan rooms would provide both emergency ventilation, in case of a tunnel fire, and regular ventilation, during non-revenue hours. The facility would also house sump pump rooms to collect water from various sources, including storm water; wash-water (from tunnel cleaning); and water from a fire-fighting incident, system testing, or pipe leaks.

9.1.1.11 Fire/Life Safety – Emergency Egress

Within the tunnel segment, emergency walkways would be provided between the center dividing wall and each track. Sliding doors would be located in the central dividing wall at required intervals to connect the two sides of the railway with a continuous walkway to allow for safe egress to a point of safety (typically at a station) during an emergency. Similarly, the aerial guideway near the LOSSAN rail corridor would include two emergency walkways with safety railing located on the outer side of the tracks. Access to tunnel segments for first responders would be through stations and the portal.

9.1.2 Construction Activities

Temporary construction activities for Alternative 5 would include project work zones at permanent facility locations, construction staging and laydown areas, and construction office areas. Construction of the transit facilities through substantial completion is expected to have a duration of 8 ¼ years. Early works, such as site preparation, demolition, and utility relocation, could start in advance of construction of the transit facilities.

For the guideway, Alternative 5 would consist of a single-bore tunnel through the Westside, Valley, and Santa Monica Mountains. The tunnel would comprise three separate segments, one running north from the southern terminus to the UCLA Gateway Plaza Station (Westside segment), one running south from the Ventura Boulevard Station to the UCLA Gateway Plaza Station (Santa Monica Mountains segment), and one running north from the Ventura Boulevard Station to the portal near Raymer Street (Valley segment). Tunnel boring machines (TBM) with approximately 45-foot-diameter cutting faces would be used to construct the tunnel segments underground. For the Westside segment, the TBM would be launched from Staging Area No. 1 in Table 9-4 at Sepulveda Boulevard and National Boulevard. For the Santa Monica Mountains segment, the TBMs would be launched from the Ventura Boulevard Station. Both TBMs would be extracted from the UCLA Gateway Plaza Station Staging Area No. 3 in Table 9-4. For the Valley segment, the TBM would be launched from Staging Area No. 8 as shown in Table 9-4 and extracted from the Ventura Boulevard Station. Figure 9-7 shows the location of construction staging locations along the Alternative 5 alignment.

Table 9-4. Alternative 5: On-Site Construction Staging Locations

No.	Location Description
1	Commercial properties on southeast corner of Sepulveda Boulevard and National Boulevard
2	North side of Wilshire Boulevard between Veteran Avenue and Gayley Avenue
3	UCLA Gateway Plaza
4	Commercial property on southwest corner of Sepulveda Boulevard and Dickens Street
5	West of Sepulveda Boulevard between US-101 and Sherman Oaks Castle Park
6	Lot behind Los Angeles Fire Department Station 88
7	Property on the west side of Sepulveda Boulevard between Sherman Way and Gault Street
8	Industrial property on both sides of Raymer Street, west of Burnet Avenue
9	South of the LOSSAN rail corridor east of Van Nuys Metrolink Station, west of Woodman Avenue

Source: STCP, 2024; HTA, 2024

Figure 9-7. Alternative 5: On-Site Construction Staging Locations

Source: STCP, 2024; HTA, 2024

The distance from the surface to the top of the tunnel for the Westside tunnel would vary from approximately 40 feet to 90 feet depending on the depth needed to construct the underground stations. The depth of the Santa Monica Mountains tunnel segment varies greatly from approximately 470 feet as it passes under the Santa Monica Mountains to 50 feet near UCLA. The depth of the Valley segment would vary from approximately 40 feet near the Ventura Boulevard/Sepulveda Station and north of the Metro G Line Sepulveda Station to 150 feet near Weddington Street. The tunnel segments through the Westside and Valley would be excavated in soft ground while the tunnel through the Santa Monica Mountains would be excavated primarily in hard ground or rock as geotechnical conditions transition from soft to hard ground near the UCLA Gateway Plaza Station.

Construction work zones would also be co-located with future MSF and station locations. All work zones would comprise the permanent facility footprint with additional temporary construction easements from adjoining properties.

All underground stations would be constructed using a "cut-and-cover" method whereby the underground station structure would be constructed within a trench excavated from the surface with a portion or all being covered by a temporary deck and backfilled during the later stages of station construction. Traffic and pedestrian detours would be necessary during underground station excavation until decking is in place and the appropriate safety measures are taken to resume cross traffic.

In addition to work zones, Alternative 5 would include construction staging and laydown areas at multiple locations along the alignment as well as off-site staging areas. Construction staging areas would provide the necessary space for the following activities:

- Contractors' equipment
- Receiving deliveries
- Testing of soils for minerals or hazards
- Storing materials
- Site offices
- Work zone for excavation
- Other construction activities (including parking and change facilities for workers, location of construction office trailers, storage, staging and delivery of construction materials and permanent plant equipment, and maintenance of construction equipment).

A larger, off-site staging area would be used for temporary storage of excavated material from both tunneling and station cut-and-cover excavation activities. Table 9-4 and Figure 9-7 present the potential construction staging areas along the alignment for Alternative 5. Table 9-5 and Figure 9-8 present candidate sites for off-site staging and laydown areas.

Table 9-5. Alternative 5: Potential Off-Site Construction Staging Locations

No.	Location Description
S1	East of Santa Monica Airport Runway
S2	Ralph's Parking Lot in Westwood Village
N1	West of Sepulveda Basin Sports Complex, south of the Los Angeles River
N2	West of Sepulveda Basin Sports Complex, north of the Los Angeles River
N3	Metro G Line Sepulveda Station Park & Ride Lot
N4	North of Roscoe Boulevard and Hayvenhurst Avenue
N5	LADWP property south of the LOSSAN rail corridor, east of Van Nuys Metrolink Station

Source: STCP, 2024; HTA, 2024

Figure 9-8. Alternative 5: Potential Off-Site Construction Staging Locations

Source: STCP, 2024; HTA, 2024

Construction of the HRT guideway between the Van Nuys Metrolink Station and the MSF would require reconfiguration of an existing rail spur serving LADWP property. The new location of the rail spur would require modification to the existing pedestrian undercrossing at the Van Nuys Metrolink Station.

Alternative 5 would require construction of a concrete casting facility for tunnel lining segments because no existing commercial fabricator capable of producing tunnel lining segments for a large-diameter tunnel exists within a practical distance of the Project Study Area. The site of the MSF would initially be

used for this casting facility. The casting facility would include casting beds and associated casting equipment, storage areas for cement and aggregate, and a field quality control facility, which would need to be constructed on-site. When a more detailed design of the facility is completed, the contractor would obtain all permits and approvals necessary from the City of Los Angeles, the South Coast Air Quality Management District, and other regulatory entities.

As areas of the MSF site begin to become available following completion of pre-casting operations, construction of permanent facilities for the MSF would begin, including construction of surface buildings such as maintenance shops, administrative offices, train control, traction power, and systems facilities. Some of the yard storage track would also be constructed at this time to allow delivery and inspection of passenger vehicles that would be fabricated elsewhere. Additional activities occurring at the MSF during the final phase of construction would include staging of trackwork and welding of guideway rail.

9.2 Existing Conditions

9.2.1 Population, Housing, and Employment Trends

Alternative 5 would be within the jurisdictions of the City of Los Angeles, the City of Santa Monica, and Sawtelle VA community of Los Angeles County. Affected communities identified within the City of Los Angeles include Bel Air, Encino, Mar Vista, North Sherman Oaks, Palms, Panorama City, Van Nuys, West Los Angeles, and Westwood.

For purposes of the economic and fiscal effects analysis, Alternative 5 would include Transportation Analysis Zones (TAZ) from Southern California Association of Governments' (SCAG) regional growth forecast and census tracts that intersect the areas within a 0.5-mile radius of the Alternative 5 proposed stations.

Population growth in these areas is projected to grow 13.2 percent by 2045, with the Wilshire Boulevard/Metro D Line Station area expecting the highest increase at 23.9 percent. Alternative 5 aims to enhance connectivity to major transit lines, including the Metro E, Metro D, and Metro G Lines, and the East San Fernando Valley Light Rail Transit Line, addressing the increasing demand for public transportation due to rising population density.

Table 9-6. Alternative 5: Future Population Growth

Area[a]	Population 2019	Population 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (U)	15,572	19,285	23.8	0.83
Santa Monica Boulevard Station (U)	24,360	29,180	19.8	0.70
Wilshire Boulevard/Metro D Line Station (U)	25,311	31,369	23.9	0.83
UCLA Gateway Plaza Station (U)	32,773	39,049	19.1	0.68
Ventura Boulevard/Sepulveda Boulevard Station (U)	19,445	21,617	11.2	0.41
Metro G Line Sepulveda Station (U)	12,659	13,773	8.8	0.32
Sherman Way Station (U)	25,408	26,925	6.0	0.22
Van Nuys Metrolink Station (A)	25,138	26,151	4.0	0.15
Total[b]	**152,904**	**173,162**	**13.2**	**0.48**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 5 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

The household growth data along the proposed HRT route in Alternative 5 indicates a notable overall increase of 31.2 percent between 2019 and 2045. Notable increases include the Metro E Line Expo/Sepulveda Station area, which is projected to grow by 41.6 percent and the UCLA Gateway Plaza Station area, which anticipates a 44.7 percent rise. The Wilshire Boulevard/Metro D Line Station area also shows a substantial increase at 40.7 percent. Table 9-7 includes detailed estimates of household growth within the Alternative 5 TAZs.

Table 9-7. Alternative 5: Future Household Growth

Area[a]	Households 2019	Households 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (U)	6,734	9,536	41.6	1.35
Santa Monica Boulevard Station (U)	11,499	15,266	32.8	1.10
Wilshire Boulevard/Metro D Line Station (U)	9,919	13,955	40.7	1.32
UCLA Gateway Plaza Station (U)	7,530	10,899	44.7	1.43
Ventura Boulevard/Sepulveda Boulevard Station (U)	8,549	10,767	25.9	0.89
Metro G Line Sepulveda Station (U)	4,818	6,092	26.4	0.91
Sherman Way Station (U)	9,225	11,386	23.4	0.81
Van Nuys Metrolink Station (A)	7,469	9,379	25.6	0.88
Total[b]	**54,963**	**72,134**	**31.2**	**1.05**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 5 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

The employment projections for areas along the proposed HRT route in Alternative 5 show a total increase of 6.9 percent between 2019 and 2045. Notable growth is expected around the Santa Monica Boulevard Station and Sherman Way Station, with increases of 11.6 percent and 9.7 percent, respectively. The Metro E Line Expo/Sepulveda Station area anticipates a 7.2 percent rise in employment. These figures highlight regional economic expansion and the potential need for enhanced public transit to support growing employment hubs and improve commuter accessibility. Major employers and industries in the region include UCLA, UCLA Medical Center, Van Nuys Airport aviation support services, entertainment companies, and healthcare services. Detailed employment counts for the relevant TAZs are included in Table 9-8.

Table 9-8. Alternative 5: Future Employment Growth

Area[a]	Employment 2019	Employment 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Sepulveda Station (U)	21,331	22,870	7.2	0.27
Santa Monica Boulevard Station (U)	35,256	39,358	11.6	0.42
Wilshire Boulevard/Metro D Line Station (U)	50,112	53,749	7.3	0.27
UCLA Gateway Plaza Station (U)	68,892	71,688	4.1	0.15
Ventura Boulevard/Sepulveda Boulevard Station (U)	20,537	21,739	5.9	0.22
Metro G Line Sepulveda Station (U)	8,368	9,030	7.9	0.29
Sherman Way Station (U)	10,272	11,271	9.7	0.36
Van Nuys Metrolink Station (A)	10,509	11,497	9.4	0.35
Total[b]	**170,832**	**182,557**	**6.9**	**0.26**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 5 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(A) = aerial
(U) = underground

9.2.2 Fiscal Trends

The State of California has enjoyed healthy tax revenue growth for the previous decade. Table 9-9 illustrates the State of California's tax revenue for the years 2016, 2020, and 2022, with data sourced from the Federal Reserve Bank of St. Louis (2024). It shows a meaningful increase in both individual income tax and general sales and gross receipts tax from 2016 through 2022. Specifically, individual income tax revenue rose from $80,753 million in 2016 to $146,190 million in 2022. Similarly, general sales and gross receipts tax revenue increased from $39,189 million in 2016 to $52,228 million in 2022. The data highlights the substantial growth in the State of California's tax revenue from 2016 through 2022. Although it is unlikely that tax revenues will continue to grow at the rapid rate seen between 2020 and 2022, it is likely that tax revenue will continue to grow as the State of California's economy expands.

Table 9-9. Alternative 5: State of California Tax Revenue

Tax Revenue	2016 ($M)	2020 ($M)	2022 ($M)
Individual Income Tax	80,753	84,412	146,190
General Sales and Gross Receipts Tax	39,189	43,650	52,228

Source: Federal Reserve Bank of St. Louis, 2024

$M = millions of dollars

The City of Los Angeles has also experienced significant tax revenue growth during the previous decade. Table 5-5 includes property tax, sales tax, and general fund revenue for the City of Los Angeles for fiscal years (FY) 2016, 2020, and 2023. Property tax rose from $1,708 million in FY 2016 to $2,563 million in FY 2023, sales tax revenue rose from $438 million to $714 million over the same period, and the General Fund revenue for the City of Los Angeles rose from $4,893 million to $7,582 million.

Table 9-10. Alternative 5: City of Los Angeles Tax Revenue

Tax Revenue	2016 ($M)	FY 2020 ($M)	FY 2023 ($M)
Total Property Tax	1,708	2,261	2,563
Sales Tax	438	525	714
Total General Fund Revenue	4,893	7,009	7,582

Source: Controller's Office, City of Los Angeles, 2017, 2021, 2024

9.3 Environmental Impacts

Alternative 5 is expected to enhance economic development in the Los Angeles region by improving connectivity between the San Fernando Valley and the Westside of Los Angeles. This high-capacity rail transit alternative would provide efficient and reliable transportation for a large and growing travel market currently dependent on the congested Sepulveda Pass and nearby canyon roads.

One of the primary benefits of Alternative 5 would be the improved access it would provide to major employment, educational, and cultural centers in the greater Los Angeles area. By linking the Van Nuys Metrolink/Amtrak and the East San Fernando Valley Light Rail Transit Line at the north end, and the Metro G Line, Metro D Line, and the Metro E Line at the south end, Alternative 5 would facilitate smoother and faster commutes and reduce travel times compared to automobile travel along regularly congested I-405. This enhanced connectivity is expected to attract businesses and workers, which would foster a more dynamic and integrated regional economy. The convenience of rapid transit access would likely stimulate real estate development and boost property values along the Sepulveda Transit Corridor.

Throughout the construction period and the operations period, Alternative 5 is anticipated to increase employment for the region. These jobs would range from construction and engineering roles to ongoing operational and maintenance positions, which would provide a healthy boost to local employment. Additionally, Alternative 5 would contribute to the long-term resiliency of the City of Los Angeles. By diversifying transportation options and reducing reliance on automobiles, the region would be better positioned to withstand economic shocks related to fuel price volatility or disruptions in road networks.

9.3.1 Construction Output, Earnings, and Employment

Construction of Alternative 5 would require substantial capital investment in the Los Angeles Metropolitan Statistical Area (MSA). The necessary spending would increase the employment, earnings, and output for the duration of the construction period. Capital cost estimates are in 2023 dollars, providing a common value for expenditures that would be distributed over several years. The following section describes the Alternative 5 expenditures and anticipated economic effects.

Capital expenditures for Alternative 5 are estimated at $21,713 million (2023 dollars). The breakdown of capital expenditures by category is shown in Table 9-11. Capital expenditures exclude ROW costs because purchasing ROW is not anticipated to support job creation. Acquiring and selling a property is a transfer of asset between entities, and there is no economic activity associated with it, except for small real estate/bank fees.

Table 9-11. Alternative 5: Summary of Capital Costs

Category	2023 ($M)
Design and Planning	5,238
Construction	15,891
Equipment	584
Total	**21,713**

Source: Metro, 2024b

$M = millions of dollars
Note: Capital cost estimates are exclusive of right-of-way acquisition costs

To isolate the potential economic effects of Alternative 5 on the local economy and the State of California, it is typical to distinguish between resources that are new to the economy — those that would be invested in the Los Angeles-Long Beach-Anaheim MSA and/or the State of California under Alternative 5 — and resources/funds that would be spent on projects in the region with similar economic effects (e.g., funds that would be allocated to other transportation construction projects in the area).

Two considerations determine the capital cost effects:

- Are the expenditures of the type likely to yield effects in the local economy?
- Are the funds used to make those expenditures new resources for the region?

At this stage of Alternative 5 development, the exact breakdown of funding distribution is subject to change. Alternative 5 is expected to be funded by a variety of local, state, and federal sources, including Measure M, which is a Los Angeles County, voter-approved, no-sunset, half-cent sales tax that funds projects to ease traffic, expand public transportation, and more (Metro, 2016). Measure M partially funds many Metro projects (Metro, 2016). For this analysis, 100 percent of Alternative 5 costs are treated as new funding to the region. This assumption yields an upper-limit estimate of economic output because of project construction. The actual effects post construction would likely be lower, after expenditures planned under the No Project Alternative, such as the Measure M funds, are removed. The Regional Input-Output Modeling System (RIMS II) analysis can be updated to reflect more accurate outputs after more detailed funding allocations become available. Equipment for Alternative 5 is expected to be sourced from outside the State of California. Therefore, the equipment cost category is not factored into the effect analysis.

Each dollar of new resources is expected to yield an economic effect. Table 9-12 provides the multiplier values for the industry categories by geographic area.

Table 9-12. Alternative 5: Comparison of Regional Input-Output Modeling System Multipliers for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Industry	Final Demand Multiplier			Direct Effect	
		Output ($)	Earnings ($)	Employment	Earnings ($)	Employment
Los Angeles-Long Beach-Anaheim MSA	Design and Planning	2.0752	0.7202	9.638	1.7681	2.2741
	Construction (Tunnel, Track and Approaches)	1.882	0.4868	7.1079	1.8935	2.1094
State of California	Design and Planning	2.1309	0.7867	10.6262	1.8193	2.3616
	Construction (Tunnel, Track and Approaches)	1.9668	0.5812	8.5522	1.8995	2.1325

Source: U.S. Bureau of Economic Analysis, 2024

$ = dollars

Using the construction industry as an example, the multipliers in Table 9-12 are interpreted as follows:

- The Final Demand Output Multiplier represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Employment Multiplier represents the total change in number of jobs that occurs in all industries for each $1 million of output delivered to final demand by the construction industry.
- The Direct Effect Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the construction industry.
- The Direct Effect Employment Multiplier represents the total change in number of jobs in all industries for each additional job in the construction industry.

Applying the Final Demand Multipliers for the construction industry to the amount of funding/resources allocated for capital expenditures provides estimates of the net output, earnings, and employment effects generated by Alternative 5 in each region. The results are summarized in Table 9-13 and Table 9-14. It is important to note that these effects are one-time effects lasting for the duration of Alternative 5 construction. One job is defined as a job for one person with a duration of one year. For example, a job for one person lasting three years would be defined as three person-year jobs.

It is noteworthy that the economic effects at the MSA level and at the state level are not additive. The economic effects at the MSA level assume that the Alternative 5 costs, with the exception of vehicle costs which were removed, would be incurred entirely in the Los Angeles-Long Beach-Anaheim MSA. Likewise, the economic effects at the state level assume that the Alternative 5 costs, also with the exception of vehicle costs, would be incurred entirely in the State of California. As previously discussed in Section 3.2.1.4, this is a high estimate because 100 percent of funding is assumed to be new to the region. Similarly, the State of California outputs assume that all costs for the alternative are new funding within the state. Table 9-13 and Table 9-14 outline two separate scenarios and illustrate the maximum economic benefits achievable from each one. For example, Alternative 5 would not generate 158,400

person-years of employment within the MSA (Table 9-13) and 185,600 within the State of California (Table 9-14) simultaneously — these should instead be considered individually.

Table 9-13. Alternative 5: Net Effects of Capital Expenditure on the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Years Jobs)
Design and Planning	5,238	2.0752	0.7202	9.638	10,870	3,773	48,931
Construction (Tunnel, Track and Approaches)	15,891	1.882	0.4868	7.1079	29,907	7,736	109,476
Total	**21,129**				**40,777**	**11,508**	**158,407**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For Los Angeles-Long Beach-Anaheim MSA, the construction spending for Alternative 5 is expected to generate $29,907 million in output (in 2023 dollars), $7,736 million in earnings, and over 109,400 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $10,870 million, earnings of $3,773 million, and employment of over 48,900 person-year jobs.

Table 9-14. Alternative 5: Net Effects of Capital Expenditure on the State of California

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Year Jobs)
Design and Planning	5,238	2.1309	0.7867	10.6262	11,162	4,121	53,948
Construction (Tunnel, Track and Approaches)	15,891	1.9668	0.5812	8.5522	31,255	9,236	131,721
Total	**21,129**				**42,417**	**13,357**	**185,669**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the State of California, the construction spending for Alternative 5 is expected to generate $31,255 million in output (in 2023 dollars), $9,236 million in earnings, and over 131,700 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $11,162 million, earnings of $4,121 million, and employment of over 53,900 person-year jobs.

9.3.2 Operational Output, Earnings, and Employment

Alternative 5 is expected to generate reoccurring employment and earnings for the region in the form of operation and maintenance staff, facility operators, and maintenance expenditures. The operations and maintenance (O&M) expenditures for Alternative 5 are expected to have a beneficial, but not substantial effect on local employment, relative to the overall employment of the region.

9.3.3 Fiscal Effects

The wages generated from Alternative 5 would boost tax revenues at the state and county levels. The middle-income tax bracket rate of 9.3 percent was chosen for the analysis, because it covers the widest range of middle-income households, those with an annual income between $68,350 and $349,137, as

shown in Table 9-15. Due to possible spillage into other income tax brackets and accounting for the limitations of this methodology, the final income and sales tax revenue generated from Alternative 5 should be considered estimates. The assumed 9.3 percent tax rate is an upper-limit estimate. The effective tax rate would be lower than 9.3 percent due to the first $68,350 of household income being taxed at the lower tax bracket. Sales tax rates for the State of California and Los Angeles County are provided in Table 9-16.

Table 9-15. Alternative 5: State of California Income Tax Rates

Income Bracket	Income Tax Rate
$0 - $10,412	1.00%
$10,412 - $24,684	2.00%
$24,684 - $38,959	4.00%
$38,959 - $54,081	6.00%
$54,081 - $68,350	8.00%
$68,350 - $349,137	9.30%
$349,137 - $418,961	10.30%
$418,961 - $698,271	11.30%
> $698,271	12.30%

Source: California Franchise Tax Board, 2023

Table 9-16. Alternative 5: Sales Tax Rates for the State of California and Los Angeles County

Region	Sales Tax Rate
State of California	7.25%
Los Angeles County	9.50%

Source: California Department of Tax and Fee Administration, 2024

9.3.3.1 Income Tax Revenue

To calculate the additional income tax earnings for the State of California, the income tax rate of 9.3 percent was used. For the Los Angeles-Long Beach-Anaheim MSA, the average income tax rate for the area was applied to the earnings generated within the MSA.

Table 9-17 shows the additional income tax generated to the MSA and state under Alternative 5. The Los Angeles-Long Beach-Anaheim MSA would generate additional income tax revenue of $1,070 million. The State of California would generate additional income tax revenue of $1,242 million. As discussed earlier in Section 9.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 9-17. Alternative 5: Additional Income Tax Generated Earnings for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings (2023 $M)	Income Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	11,508	1,070
State of California	13,357	1,242

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

9.3.3.2 Sales Tax Revenue

The incremental consumption from new earnings would also boost sale tax revenues for the MSA and the State of California. To estimate the potential increase in sales tax, calculations should account for the portion of consumption subject to sales tax and income tax deductions, as follows:

- Consumption expenditure subject to sales tax requires the identification of the share of the consumption basket that is taxable. The categories included in the analysis represent the typical expenditure for a household in the State of California. Taxable expenditures include food away from home, alcoholic beverages, apparel and services, transportation, entertainment, and personal care products (Table 9-18). For the State of California, around 29 percent of consumption expenditure is subject to sales tax (U.S. Bureau of Labor Statistics, 2020). The 29 percent value is applied to both the MSA and State of California earnings to generate the expected sales tax revenue increase. A breakdown of California household annual taxable expenditures is available in Table 9-19. Household expenditures are based on the U.S. Bureau of Labor Statistics calculated average of 2.7 individuals per California household.
- After-tax earnings exclude income tax from gross earnings, as identified in Table 9-19.

Table 9-18. Alternative 5: Average Household Annual Taxable Expenditures in the State of California, 2019-2020

Category	Expenditure Means
Food away from home	$3,596.47
Alcoholic beverages	$666.20
Apparel and services	$1,738.69
Transportation	$10,499.82
Entertainment	$3,134.81
Personal care products	$813.00
Total	**$20,448.99**
Average annual expenditures	$70,830.25
Annual expenditures subject to sales tax	**29%**

Source: U.S. Bureau of Labor Statistics, 2020

Table 9-19 provides the additional sales tax generated from the MSA and state under Alternative 5. The MSA and State of California would generate sales tax earnings of $288 million and $255 million, respectively. As discussed earlier in Section 9.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 9-19. Alternative 5: Sales Tax Revenues Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings after Income Tax Deductions (2023 $M)[a]	Taxable Consumption Expenditure (2023 $M)[b]	Sales Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	10,438	3,027	288
State of California	12,115	3,513	255

Source: BEA, 2024; Metro, 2024b

[a]This is equal to the total consumption expenditure.
[b]Figured at 29 percent of total consumption expenditure.

2023 $M = millions in 2023 dollars

9.3.3.3 Property Tax Revenue

To construct Alternative 5, it would be necessary to acquire private land and structures for easements, ROWs, parking, and station facilities. These acquisitions would remove the properties from the local tax base, which would reduce annual tax revenue.

Including temporary takes during construction and applying a conservative assumption that both partial and full takes would result in property tax loss for the full parcel, it is estimated that less than 0.16 percent of the Los Angeles County or City of Los Angeles annual property tax revenue would be impacted relative to 2023 assessed parcel values and the total 2023 property tax revenues (County of Los Angeles, 2023; Controller's Office, City of Los Angeles, 2024). The calculated revenue loss would be well below the annual change in levied taxes, which increased 5.5 percent in fiscal year 2022-2023 from fiscal year 2022-2023 (County of Los Angeles, 2023). The projected loss in tax revenues associated with Alternative 5 would not compromise the county's or city's ability to provide services or generate an adverse effect.

Additionally, proximity to public transit can increase property values in both residential and commercial real estate markets (APTA, 2019), potentially offsetting property tax loss from parcel acquisition. For example, between 2012 and 2016, residential property values near transit areas increased by 61 percent, 8 percentage points more than in non-transit areas. Commercial properties near transit performed better than other commercial properties in the region, with a 73 percent increase in property value in the transit areas versus 58 percent in the region.

9.4 Mitigation Measures

9.4.1 Construction Effects

Table 9-20 shows the additional annual employment generated in the short term would be 0.30 percent of existing employment in the Los Angeles-Long Beach-Anaheim MSA and 0.12 percent of existing employment in the State of California. Additionally, the employment generated as a result of Alternative 5 would be distributed throughout the construction life of Alternative 5. The over 158,400 person-year jobs would not occur within the same year, smoothing the effects of Alternative 5-related employment further. Assuming an 8¼ year construction timeline for Alternative 5, the alternative is projected to generate an additional 19,200 jobs annually within the MSA. Additional employment generated from Alternative 5 would be a relatively small increase in overall employment and would have a beneficial effect on the local economy. Therefore, no mitigation measures are required.

Table 9-20. Alternative 5: Employment Effects Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Short-Term Employment Generated (Person-Year Jobs	Jobs Created Annually (8¼ year construction schedule)	Existing Employment[a] (2024)	Short-Term Employment Generated[b]
Los Angeles-Long Beach-Anaheim MSA	158,407	19,201	6,346,100	0.30%
State of California	185,669	22,505	18,104,800	0.12%

Source: U.S. Bureau of Labor Statistics, 2025a, 2025b

[a]October 2024 Total Nonfarm, Not Seasonally Adjusted
[b]Jobs Created Annually/Employment

9.4.2 Operational Effects

Annual O&M costs would be a fraction of the construction costs, which would require no mitigation measures. Therefore, there will also be no mitigation measures required for operational effects.

9.4.3 Impacts After Mitigation

No mitigation measures are required; impacts are less than significant.

10 ALTERNATIVE 6

10.1 Alternative Description

Alternative 6 is a heavy rail transit (HRT) system with an underground track configuration. This alternative would provide transfers to five high-frequency fixed guideway transit and commuter rail lines, including the Los Angeles County Metropolitan Transportation Authority's (Metro) E, Metro D, and Metro G Lines, East San Fernando Valley Light Rail Transit Line, and the Metrolink Ventura County Line. The length of the alignment between the terminus stations would be approximately 12.9 miles.

The seven underground HRT stations would be as follows:

1. Metro E Line Expo/Bundy Station (underground)
2. Santa Monica Boulevard Station (underground)
3. Wilshire Boulevard/Metro D Line Station (underground)
4. UCLA Gateway Plaza Station (underground)
5. Ventura Boulevard/Van Nuys Boulevard Station (underground)
6. Metro G Line Van Nuys Station (underground)
7. Van Nuys Metrolink Station (underground)

10.1.1 Operating Characteristics

10.1.1.1 Alignment

As shown on Figure 10-1, from its southern terminus station at the Metro E Line Expo/Bundy Station, the alignment of Alternative 6 would run underground through the Westside of Los Angeles (Westside), the Santa Monica Mountains, and the San Fernando Valley (Valley) to the alignment's northern terminus adjacent to the Van Nuys Metrolink/Amtrak Station.

The proposed southern terminus station would be located beneath the Bundy Drive and Olympic Boulevard intersection. Tail tracks for vehicle storage would extend underground south of the station along Bundy Drive for approximately 1,500 feet, terminating just north of Pearl Street. The alignment would continue north beneath Bundy Drive before turning to the east near Iowa Avenue to run beneath Santa Monica Boulevard. The Santa Monica Boulevard Station would be located between Barrington Avenue and Federal Avenue. After leaving the Santa Monica Boulevard Station, the alignment would turn to the northeast and pass under Interstate 405 (I-405) before reaching the Wilshire Boulevard/Metro D Line Station beneath the Metro D Line Westwood/UCLA Station, which is currently under construction as part of the Metro D Line Extension Project. From there, the underground alignment would curve slightly to the northeast and continue beneath Westwood Boulevard before reaching the UCLA Gateway Plaza Station.

Figure 10-1. Alternative 6: Alignment

Source: HTA, 2024

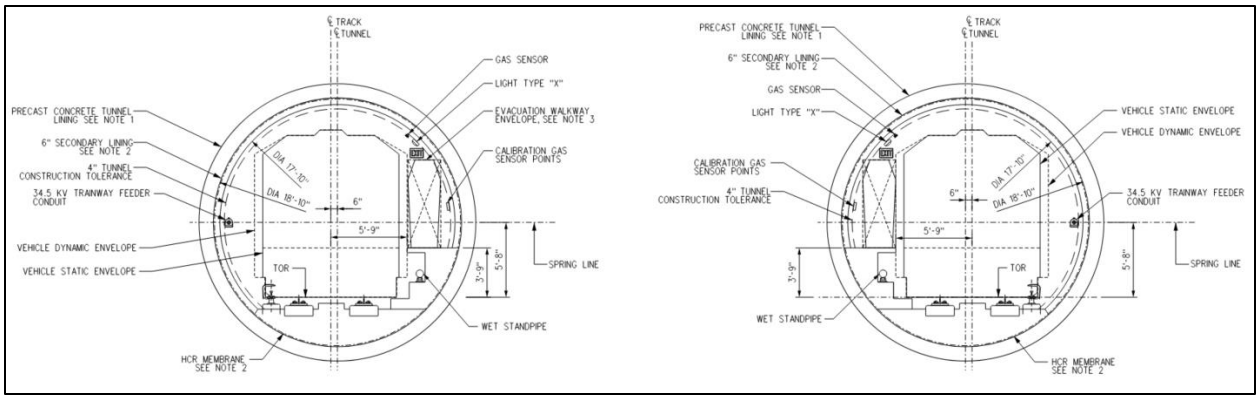
After leaving the UCLA Gateway Plaza Station, the alignment would continue to the north and travel under the Santa Monica Mountains. While still under the mountains, the alignment would shift slightly to the west to travel under the City of Los Angeles Department of Water and Power (LADWP) Stone Canyon Reservoir property to facilitate placement of a ventilation shaft on that property east of the reservoir. The alignment would then continue to the northeast to align with Van Nuys Boulevard at Ventura Boulevard as it enters the San Fernando Valley. The Ventura Boulevard Station would be beneath Van Nuys Boulevard at Moorpark Street. The alignment would then continue under Van Nuys

Boulevard before reaching the Metro G Line Van Nuys Station just south of Oxnard Street. North of the Metro G Line Van Nuys Station, the alignment would continue under Van Nuys Boulevard until reaching Sherman Way, where it would shift slightly to the east and run parallel to Van Nuys Boulevard before entering the Van Nuys Metrolink Station. The Van Nuys Metrolink Station would serve as the northern terminus station and would be located between Saticoy Street and Keswick Street. North of the station, a yard lead would turn sharply to the southeast and transition to an at-grade configuration and continue to the proposed maintenance and storage facility (MSF) east of the Van Nuys Metrolink Station.

10.1.1.2 Guideway Characteristics

The alignment of Alternative 6 would be underground using Metro's standard twin-bore tunnel design. Figure 10-2 shows a typical cross-section of the underground guideway. Cross-passages would be constructed at regular intervals in accordance with Metro Rail Design Criteria (MRDC). Each of the tunnels would have a diameter of 19 feet (not including the thickness of wall). Each tunnel would include an emergency walkway that measures a minimum of 2.5 feet wide for evacuation.

Figure 10-2. Typical Underground Guideway Cross-Section



Source: HTA, 2024

10.1.1.3 Vehicle Technology

Alternative 6 would utilize driver-operated steel-wheel HRT trains, as used on the Metro B and D Lines, with planned peak headways of 4 minutes and off-peak-period headways ranging from 8 to 20 minutes. Trains would consist of four or six cars and are expected to consist of six cars during the peak period. The HRT vehicle would have a maximum operating speed of 67 miles per hour; actual operating speeds would depend on the design of the guideway and distance between stations. Train cars would be 10.3 feet wide with three double doors on each side. Each car would be approximately 75 feet long with capacity for 133 passengers. Trains would be powered by a third rail.

10.1.1.4 Stations

Alternative 6 would include seven underground stations with station platforms measuring 450 feet long. The southern terminus underground station would be adjacent to the existing Metro E Line Expo/Bundy Station, and the northern terminus underground station would be located south of the existing Van Nuys Metrolink/Amtrak Station. Except for the Wilshire Boulevard/Metro D Line, UCLA Gateway Plaza, and Metro G Line Van Nuys Stations, all stations would have a 30-foot-wide center platform. The Wilshire/Metro D Line Station would have a 32-foot-wide platform to accommodate the anticipated passenger transfer volumes, and the UCLA Gateway Plaza Station would have a 28-foot-wide platform because of the width constraint between the existing buildings. At the Metro G Line Van Nuys Station,

the track separation would increase significantly in order to straddle the future East San Fernando Valley Light Rail Transit Line Station piles. The platform width at this station would increase to 58 feet.

The following information describes each station, with relevant entrance, walkway, and transfer information. Bicycle parking would be provided at each station.

Metro E Line Expo/Bundy Station

- This underground station would be located under Bundy Drive at Olympic Boulevard.
- Station entrances would be located on either side of Bundy Drive between the Metro E Line and Olympic Boulevard, as well as on the northeast corner of Bundy Drive and Mississippi Avenue.
- At the existing Metro E Line Expo/Bundy Station, escalators from the plaza to the platform level would be added to improve inter-station transfers.
- An 80-space parking lot would be constructed east of Bundy Drive and north of Mississippi Avenue. Passengers would also be able to park at the existing Metro E Line Expo/Bundy Station parking facility, which provides 217 parking spaces.

Santa Monica Boulevard Station

- This underground station would be located under Santa Monica Boulevard between Barrington Avenue and Federal Avenue.
- Station entrances would be located on the southwest corner of Santa Monica Boulevard and Barrington Avenue and on the southeast corner of Santa Monica Boulevard and Federal Avenue.
- No dedicated station parking would be provided at this station.

Wilshire Boulevard/Metro D Line Station

- This underground station would be located under Gayley Avenue between Wilshire Boulevard and Lindbrook Drive.
- A station entrance would be provided on the northwest corner of Midvale Avenue and Ashton Avenue. Passengers would also be able to use the Metro D Line Westwood/UCLA Station entrances to access the station platform.
- Direct internal station transfers to the Metro D Line would be provided at the south end of the station.
- No dedicated station parking would be provided at this station.

UCLA Gateway Plaza Station

- This underground station would be located underneath Gateway Plaza on the University of California, Los Angeles (UCLA) campus.
- Station entrances would be provided on the north side of Gateway Plaza, north of the Luskin Conference Center, and on the east side of Westwood Boulevard across from Strathmore Place.
- No dedicated station parking would be provided at this station.

Ventura Boulevard/Van Nuys Boulevard Station

- This underground station would be located under Van Nuys Boulevard at Moorpark Street.
- The station entrance would be located on the northwest corner of Van Nuys Boulevard and Ventura Boulevard.
- Two parking lots with a total of 185 parking spaces would be provided on the west side of Van Nuys Boulevard between Ventura Boulevard and Moorpark Street.

Metro G Line Van Nuys Station

- This underground station would be located under Van Nuys Boulevard south of Oxnard Street.
- The station entrance would be located on the southeast corner of Van Nuys Boulevard and Oxnard Street.
- Passengers would be able to park at the existing Metro G Line Van Nuys Station parking facility, which provides 307 parking spaces. No additional automobile parking would be provided at the proposed station.

Van Nuys Metrolink Station

- This underground station would be located immediately east of Van Nuys Boulevard between Saticoy Street and Keswick Street.
- Station entrances would be located on the northeast corner of Van Nuys Boulevard and Saticoy Street and on the east side of Van Nuys Boulevard just south of the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor.
- Existing Metrolink Station parking would be reconfigured, maintaining approximately the same number of spaces. Metrolink parking would not be available to Metro transit riders.

10.1.1.5 Station-to-Station Travel Times

Table 10-1 presents the station-to-station distance and travel times for Alternative 6. The travel times include both run time and dwell time. Dwell time is 30 seconds for stations anticipated to have higher passenger volumes and 20 seconds for other stations. Northbound and southbound travel times vary slightly because of grade differentials and operational considerations at end-of-line stations.

Table 10-1. Alternative 6: Station-to-Station Travel Times and Station Dwell Times

From Station	To Station	Distance (miles)	Northbound Station-to-Station Travel Time (seconds)	Southbound Station-to-Station Travel Time (seconds)	Dwell Time (seconds)
Metro E Line Station					*20*
Metro E Line	Santa Monica Boulevard	1.1	111	121	—
Santa Monica Boulevard Station					*20*
Santa Monica Boulevard	Wilshire/Metro D Line	1.3	103	108	—
Wilshire/Metro D Line Station					*30*
Wilshire/Metro D Line	UCLA Gateway Plaza	0.7	69	71	—
UCLA Gateway Plaza Station					*30*
UCLA Gateway Plaza	Ventura Boulevard	5.9	358	358	—
Ventura Boulevard Station					*20*
Ventura Boulevard	Metro G Line	1.8	135	131	—
Metro G Line Station					*30*
Metro G Line	Van Nuys Metrolink	2.1	211	164	—
Van Nuys Metrolink Station					*30*

Source: HTA, 2024

— = no data

10.1.1.6 Special Trackwork

Alternative 6 would include seven double crossovers within the revenue service alignment, enabling trains to cross over to the parallel track with terminal stations having an additional double crossover beyond the end of the platform.

10.1.1.7 Maintenance and Storage Facility

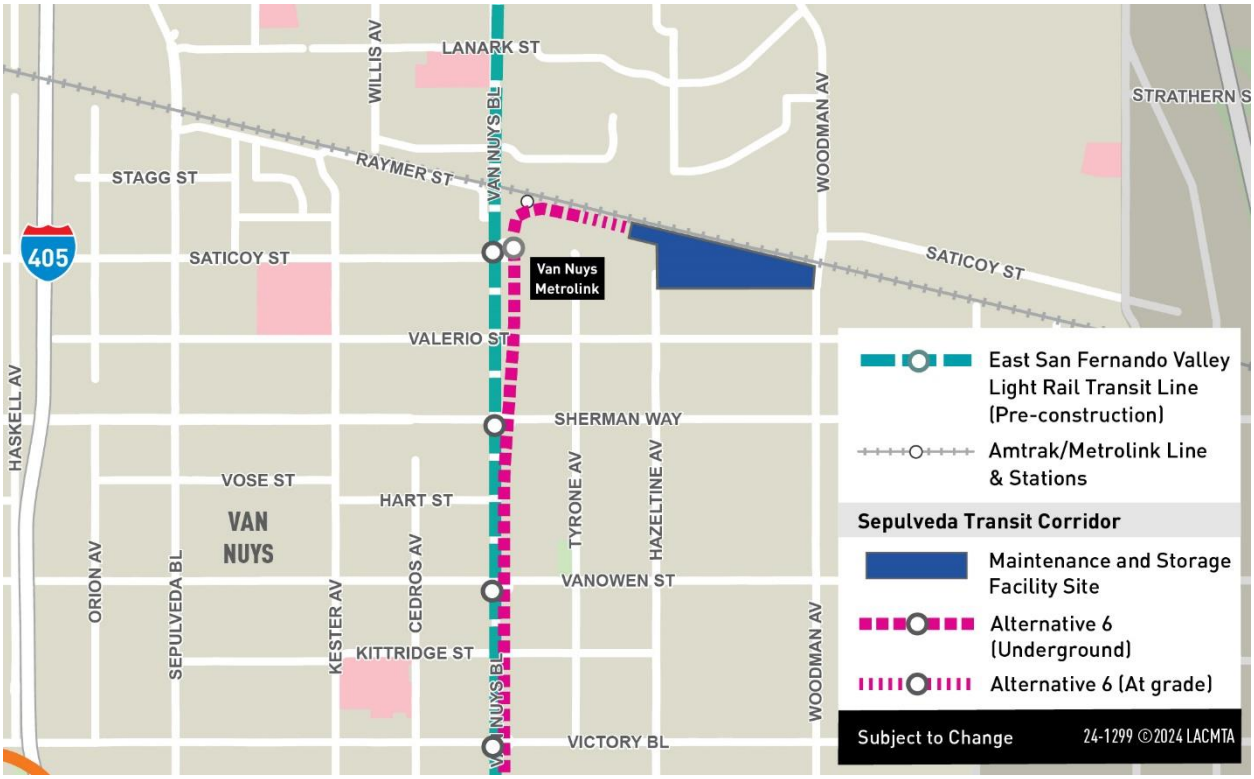
The MSF for Alternative 6 would be located east of the Van Nuys Metrolink Station and would encompass approximately 41 acres. The MSF would be designed to accommodate 94 vehicles and would be bounded by single-family residences to the south, the LOSSAN rail corridor to the north, Woodman Avenue to the east, and Hazeltine Avenue and industrial manufacturing enterprises to the west. Heavy rail trains would transition from underground to an at-grade configuration near the MSF, the northwest corner of the site. Trains would then travel southeast to maintenance facilities and storage tracks.

The site would include the following facilities:

- Two entrance gates with guard shacks
- Maintenance facility building
- Maintenance-of-way facility
- Storage tracks
- Carwash
- Cleaning platform
- Administrative offices
- Pedestrian bridge connecting the administrative offices to employee parking
- Two traction power substations (TPSS)

Figure 10-3 shows the location of the MSF for Alternative 6.

Figure 10-3. Alternative 6: Maintenance and Storage Facility Site



Source: HTA, 2024

10.1.1.8 Traction Power Substations

TPSSs transform and convert high voltage alternating current supplied from power utility feeders into direct current suitable for transit operation. Twenty-two TPSS facilities would be located along the alignment and would be spaced approximately 1 mile apart except within the Santa Monica Mountains. Each at-grade TPSS along the alignment would be approximately 5,000 square feet. Table 10-2 lists the TPSS locations for Alternative 6.

Figure 10-4 shows the TPSS locations along the Alternative 6 alignment.

Table 10-2. Alternative 6: Traction Power Substation Locations

TPSS No.	TPSS Location Description	Configuration
1 and 2	TPSSs 1 and 2 would be located immediately north of the Bundy Drive and Mississippi Avenue intersection.	Underground (within station)
3 and 4	TPSSs 3 and 4 would be located east of the Santa Monica Boulevard and Stoner Avenue intersection.	Underground (within station)
5 and 6	TPSSs 5 and 6 would be located southeast of the Kinross Avenue and Gayley Avenue intersection.	Underground (within station)
7 and 8	TPSSs 7 and 8 would be located at the north end of the UCLA Gateway Plaza Station.	Underground (within station)
9 and 10	TPSSs 9 and 10 would be located east of Stone Canyon Reservoir on LADWP property.	At-grade
11 and 12	TPSSs 11 and 12 would be located at the Van Nuys Boulevard and Ventura Boulevard intersection.	Underground (within station)
13 and 14	TPSSs 13 and 14 would be located immediately south of Magnolia Boulevard and west of Van Nuys Boulevard.	At-grade
15 and 16	TPSSs 15 and 16 would be located along Van Nuys Boulevard between Emelita Street and Califa Street.	Underground (within station)
17 and 18	TPSSs 17 and 18 would be located east of Van Nuys Boulevard and immediately north of Vanowen Street.	At-grade
19 and 20	TPSSs 19 and 20 would be located east of Van Nuys Boulevard between Saticoy Street and Keswick Street.	Underground (within station)
21 and 22	TPSSs 21 and 22 would be located south of the Metrolink tracks and east of Hazeltine Avenue.	At-grade (within MSF)

Source: HTA, 2024

Figure 10-4. Alternative 6: Traction Power Substation Locations

Source: HTA, 2024

10.1.1.9 Roadway Configuration Changes

In addition to the access road described in the following section, Alternative 6 would require reconstruction of roadways and sidewalks near stations.

10.1.1.10 Ventilation Facilities

Tunnel ventilation for Alternative 6 would be similar to existing Metro ventilation systems for light and heavy rail underground subways. In case of emergency, smoke would be directed away from trains and extracted through the use of emergency ventilation fans installed at underground stations and crossover locations adjacent to the stations. In addition, a mid-mountain facility located on LADWP property east of Stone Canyon Reservoir in the Santa Monica Mountains would include a ventilation shaft for the extraction of air, along with two TPSSs. An access road from the Stone Canyon Reservoir access road would be constructed to the location of the shaft, requiring grading of the hillside along its route.

10.1.1.11 Fire/Life Safety – Emergency Egress

Each tunnel would include an emergency walkway that measures a minimum of 2.5 feet wide for evacuation. Cross-passages would be provided at regular intervals to connect the two tunnels to allow for safe egress to a point of safety (typically at a station) during an emergency. Access to tunnel segments for first responders would be through stations.

10.1.2 Construction Activities

Temporary construction activities for Alternative 6 would include construction of ancillary facilities, as well as guideway and station construction and construction staging and laydown areas, which would be co-located with future MSF and station locations. Construction of the transit facilities through substantial completion is expected to have a duration of 7½ years. Early works, such as site preparation, demolition, and utility relocation, could start in advance of construction of the transit facilities.

For the guideway, twin-bore tunnels would be constructed using two tunnel boring machines (TBM). The tunnel alignment would be constructed over three segments—including the Westside, Santa Monica Mountains, and Valley—using a different pair of TBMs for each segment. For the Westside segment, the TBMs would be launched from the Metro E Line Station and retrieved at the UCLA Gateway Plaza Station. For the Santa Monica Mountains segment, the TBMs would operate from the Ventura Boulevard Station in a southerly direction for retrieval from UCLA Gateway Plaza Station. In the Valley, TBMs would be launched from the Van Nuys Metrolink Station and retrieved at the Ventura Boulevard Station.

The distance from the surface to the top of the tunnels would vary from approximately 50 feet to 130 feet in the Westside, between 120 feet and 730 feet in the Santa Monica Mountains, and between 40 feet and 75 feet in the Valley.

Construction work zones would also be co-located with future MSF and station locations. All work zones would comprise the permanent facility footprint with additional temporary construction easements from adjoining properties. In addition to permanent facility locations, TBM launch at the Metro E Line Station would require the closure of I-10 westbound off-ramps at Bundy Drive for the duration of the Sepulveda Transit Corridor Project (Project) construction.

Alternative 6 would include seven underground stations. All stations would be constructed using a “cut-and-cover” method whereby the station structure would be constructed within a trench excavated from the surface that is covered by a temporary deck and backfilled during the later stages of station construction. Traffic and pedestrian detours would be necessary during underground station excavation until decking is in place and the appropriate safety measures have been taken to resume cross traffic. In addition, portions of the Wilshire Boulevard/Metro D Line Station crossing underneath the Metro D Line Westwood/UCLA Station and underneath a mixed-use building at the north end of the station would be

constructed using sequential excavation method as it would not be possible to excavate the station from the surface.

Construction of the MSF site would begin with demolition of existing structures, followed by earthwork and grading. Building foundations and structures would be constructed, followed by yard improvements and trackwork, including paving, parking lots, walkways, fencing, landscaping, lighting, and security systems. Finally, building mechanical, electrical, and plumbing systems, finishes, and equipment would be installed. The MSF site would also be used as a staging site.

Station and MSF sites would be used for construction staging areas. A construction staging area, shown on Figure 10-5, would also be located off Stone Canyon Road northeast of the Upper Stone Canyon Reservoir. In addition, temporary construction easements outside of the station and MSF footprints would be required along Bundy Drive, Santa Monica Boulevard, Wilshire Boulevard, and Van Nuys Boulevard. The westbound to southbound loop off-ramp of the I-10 interchange at Bundy Drive would also be used as a staging area and would require extended ramp closure. Construction staging areas would provide the necessary space for the following activities:

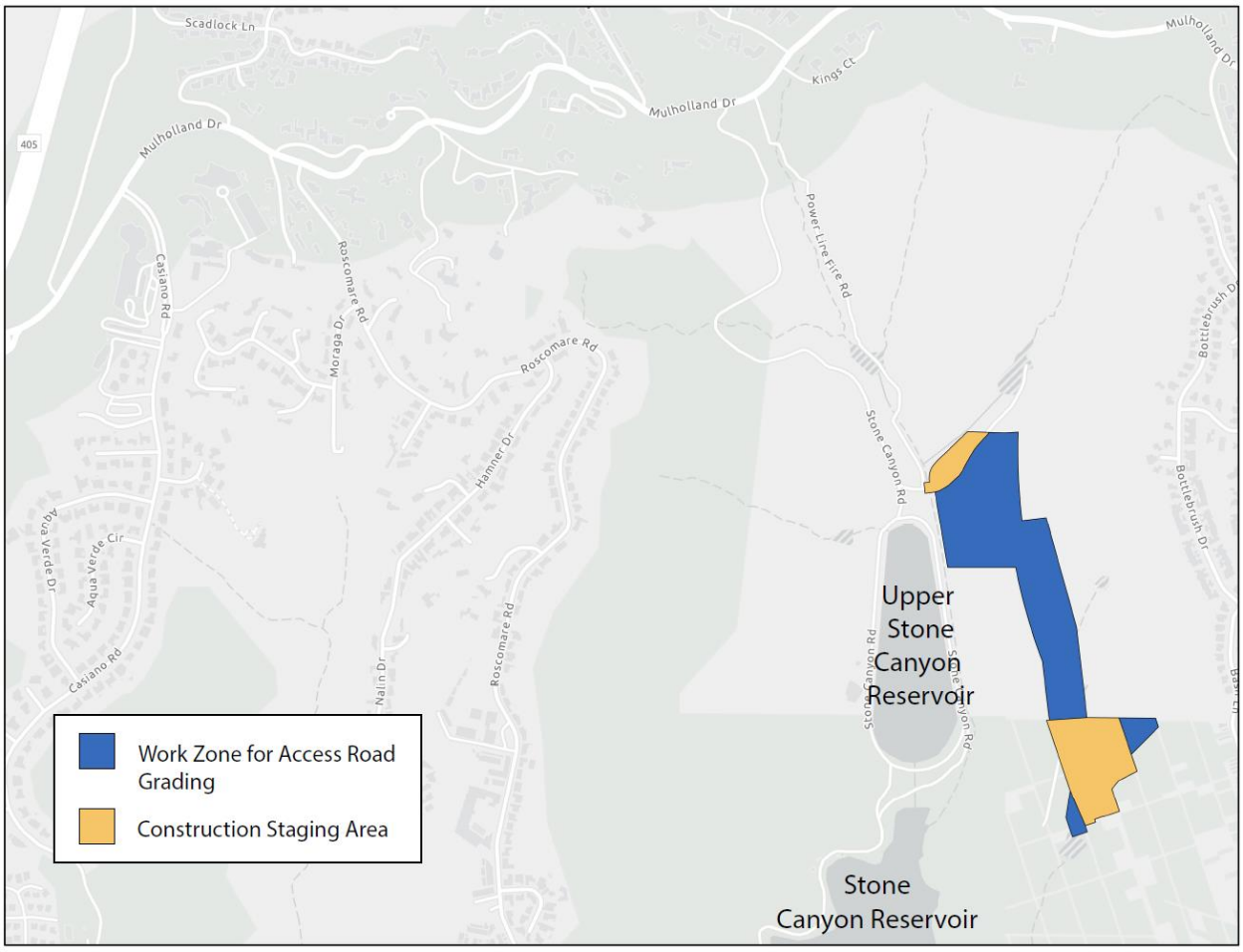
- Contractors' equipment
- Receiving deliveries
- Testing of soils for minerals or hazards
- Storing materials
- Site offices
- Work zone for excavation
- Other construction activities (including parking and change facilities for workers, location of construction office trailers, storage, staging and delivery of construction materials and permanent plant equipment, and maintenance of construction equipment)

The size of proposed construction staging areas for each station would depend on the level of work to be performed for a specific station and considerations for tunneling, such as TBM launch or extraction. Staging areas required for TBM launching would include areas for launch and access shafts, cranes, material and equipment, precast concrete segmental liner storage, truck wash areas, mechanical and electrical shops, temporary services, temporary power, ventilation, cooling tower, plants, temporary construction driveways, storage for spoils, and space for field offices.

Alternative 6 would also include several ancillary facilities and structures, including TPSS structures, a deep vent shaft structure at Stone Canyon Reservoir, as well as additional vent shafts at stations and crossovers. TPSSs would be co-located with MSF and station locations, except for two TPSSs at the Stone Canyon Reservoir vent shaft and four along Van Nuys Boulevard in the Valley. The Stone Canyon Reservoir vent shaft would be constructed using a vertical shaft sinking machine that uses mechanized shaft sinking equipment to bore a vertical hole down into the ground. Operation of the machine would be controlled and monitored from the surface. The ventilation shaft and two TPSSs in the Santa Monica Mountains would require an access road within the LADWP property at Stone Canyon Reservoir. Construction of the access road would require grading east of the reservoir. Construction of all mid-mountain facilities would take place within the footprint shown on Figure 10-5.

Additional vent shafts would be located at each station with one potential intermediate vent shaft where stations are spaced apart. These vent shafts would be constructed using the typical cut-and-cover method, with lateral bracing as the excavation proceeds. During station construction, the shafts would likely be used for construction crew, material, and equipment access.

Figure 10-5. Alternative 6: Mid-Mountain Construction Staging Site



Source: HTA, 2024

Alternative 6 would utilize precast tunnel lining segments in the construction of the transit tunnels. These tunnel lining segments would be similar to those used in recent Metro underground transit projects. Therefore, it is expected that the tunnel lining segments would be obtained from an existing casting facility in Los Angeles County and no additional permits or approvals would be necessary specific to the facility.

10.2 Existing Conditions

10.2.1 Population, Housing, and Employment Trends

Alternative 6 is within the jurisdictions of the City of Los Angeles, the City of Santa Monica, and the Sawtelle VA community of Los Angeles County. Affected communities identified within the City of Los Angeles include Bel Air, Mar Vista, North Sherman Oaks, Panorama City, Sherman Oaks, Van Nuys, West Los Angeles, and Westwood.

For purposes of the economic and fiscal effects analysis, Alternative 6 would include Transportation Analysis Zones (TAZ) from Southern California Association of Governments' (SCAG) regional growth

forecast and census tracts that intersect the areas within a 0.5-mile radius of the Alternative 6 proposed stations.

Population projections for these areas anticipate a 14.9 percent total increase between 2019 and 2045, with notable growth at Wilshire Boulevard/Metro D Line Station (23.9 percent), UCLA Gateway Plaza Station (19.4 percent), and Metro E Line Expo/Bundy Station (26.6 percent). This growth underscores the need for comprehensive transit solutions to support urban expansion and enhance connectivity in these densely populated areas. Table 10-3 includes detailed information on population growth for each of the Alternative 6 TAZs.

Table 10-3. Alternative 6: Future Population Growth

Area[a]	Population 2019	Population 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Bundy Station (U)	19,556	24,763	26.6	0.91
Santa Monica Boulevard Station (U)	30,755	35,266	14.7	0.53
Wilshire Boulevard/Metro D Line Station (U)	25,311	31,369	23.9	0.83
UCLA Gateway Plaza Station (U)	31,380	37,482	19.4	0.69
Ventura Boulevard/Van Nuys Boulevard Station (U)	23,527	24,964	6.1	0.23
Metro G Line/Van Nuys Station (U)	21,032	23,721	12.8	0.46
Van Nuys Metrolink Station (U)	20,644	21,732	5.3	0.20
Total[b]	**147,961**	**170,070**	**14.9**	**0.54**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 6 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(U) = underground

The household growth projections along the proposed HRT route in Alternative 6 indicate a substantial overall increase of 32.1 percent between 2019 and 2045. The UCLA Gateway Plaza Station area is expected to experience the highest growth, with a 47.3 percent increase in households, followed closely by the Metro E Line Expo/Bundy Station area at 47.0 percent. The Wilshire Boulevard/Metro D Line Station is also projected to grow meaningfully, with an increase of 40.7 percent. Table 10-4 includes detailed household growth projections within Alternative 6 TAZs.

Table 10-4. Alternative 6: Future Household Growth

Area[a]	Households 2019	Households 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Bundy Station (U)	9,004	13,233	47.0	1.49
Santa Monica Boulevard Station (U)	15,340	19,321	26.0	0.89
Wilshire Boulevard/Metro D Line Station (U)	9,919	13,955	40.7	1.32
UCLA Gateway Plaza Station (U)	6,762	9,963	47.3	1.50
Ventura Boulevard/Van Nuys Boulevard Station (U)	11,137	13,185	18.4	0.65
Metro G Line/Van Nuys Station (U)	7,830	10,369	32.4	1.09
Van Nuys Metrolink Station (U)	6,230	7,928	27.3	0.93
Total[b]	**57,052**	**75,345**	**32.1**	**1.08**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 6 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(U) = underground

The employment projections along the proposed HRT route in Alternative 6 indicate an overall increase of 6.1 percent between 2019 and 2045. Larger increases are expected at the Van Nuys Metrolink Station (9.7 percent) and Metro G Line/Van Nuys Station (8.0 percent). The Ventura Boulevard/Van Nuys Boulevard Station area is projected to experience an 8.1 percent rise in employment, while the Metro E Line Expo/Bundy Station area anticipates a 4.3 percent increase. These figures, included in Table 10-5, suggest expanding employment opportunities, emphasizing the need for improved transit infrastructure to support workforce mobility in these regions. Major employers and industries in the region include the UCLA, UCLA Medical Center, Van Nuys Airport, entertainment companies, and healthcare services. Detailed employment counts for the relevant TAZs are included in Table 10-5.

Table 10-5. Alternative 6: Future Employment Growth

Area[a]	Employment 2019	Employment 2045	Change (%)	Average Annual Change (%)
Metro E Line Expo/Bundy Station (U)	38,882	40,555	4.3	0.16
Santa Monica Boulevard Station (U)	41,098	43,547	6.0	0.22
Wilshire Boulevard/Metro D Line Station (U)	50,112	53,749	7.3	0.27
UCLA Gateway Plaza Station (U)	68,512	71,199	3.9	0.15
Ventura Boulevard/Van Nuys Boulevard Station (U)	16,674	18,026	8.1	0.30
Metro G Line/Van Nuys Station (U)	14,472	15,629	8.0	0.30
Van Nuys Metrolink Station (U)	9,122	10,010	9.7	0.36
Total[b]	**189,543**	**201,050**	**6.1**	**0.23**

Source: SCAG, 2024a

[a]Station areas follow Transportation Analysis Zones that would intersect the 0.5-mile radius of Alternative 6 proposed stations.

[b]Total is the combined station areas and accounts for station area overlap.

(U) = underground

10.2.2 Fiscal Trends

The State of California has enjoyed healthy tax revenue growth for the previous decade. Table 10-6 illustrates the State of California tax revenue for the years 2016, 2020, and 2022, with data sourced from the Federal Reserve Bank of St. Louis (2024). It shows a meaningful increase in both individual income tax and general sales and gross receipts tax from 2016 through 2022. Specifically, individual income tax revenue rose from $80,753 million in 2016 to $146,190 million in 2022. Similarly, general sales and gross receipts tax revenue increased from $39,189 million in 2016 to $52,228 million in 2022. The data highlights the substantial growth in the State of California's tax revenue from 2016 through 2022. Although it is unlikely that tax revenues will continue to grow at the rapid rate seen between 2020 and 2022, it is likely that tax revenue will continue to grow as the State of California's economy expands.

Table 10-6. Alternative 6: State of California Tax Revenue

Tax Revenue	2016 ($M)	2020 ($M)	2022 ($M)
Individual Income Tax	80,753	84,412	146,190
General Sales and Gross Receipts Tax	39,189	43,650	52,228

Source: Federal Reserve Bank of St. Louis, 2024

$M = millions of dollars

The City of Los Angeles has also experienced significant tax revenue growth during the previous decade. Table 5-5 includes property tax, sales tax, and general fund revenue for the City of Los Angeles for fiscal years (FY) 2016, 2020, and 2023. Property tax rose from $1,708 million in FY 2016 to $2,563 million in FY 2023, sales tax revenue rose from $438 million to $714 million over the same period, and the General Fund revenue for the City of Los Angeles rose from $4,893 million to $7,582 million.

Table 10-7. Alternative 6: City of Los Angeles Tax Revenue

Tax Revenue	2016 ($M)	FY 2020 ($M)	FY 2023 ($M)
Total Property Tax	1,708	2,261	2,563
Sales Tax	438	525	714
Total General Fund Revenue	4,893	7,009	7,582

Source: Controller's Office, City of Los Angeles, 2017, 2021, 2024

10.3 Environmental Impacts

Alternative 6 is expected to enhance economic development in the Los Angeles region by improving connectivity between the San Fernando Valley and the Westside of Los Angeles. This high-capacity rail transit alternative would provide efficient and reliable transportation for a large and growing travel market currently dependent on the congested Sepulveda Pass and nearby canyon roads.

One of the primary benefits of Alternative 6 is the improved access it provides to major employment, educational, and cultural centers in the greater Los Angeles area. By linking the Van Nuys Metrolink/Amtrak Station in the north with the Metro E Line in the south, Alternative 6 would facilitate smoother and faster commutes and reduce travel times compared to automobile travel along regularly congested I-405. This enhanced connectivity is expected to attract businesses and workers, which would foster a more dynamic and integrated regional economy. The convenience of rapid transit access would likely stimulate real estate development and boost property values along the Sepulveda Transit Corridor.

Throughout the construction period and the operations period, Alternative 6 is anticipated to increase employment for the region. Jobs would range from construction and engineering roles to ongoing operational and maintenance positions, which would provide a healthy boost to local employment. Additionally, Alternative 6 would contribute to the long-term resiliency of the City of Los Angeles. By diversifying transportation options and reducing reliance on automobiles, the region would be better positioned to withstand economic shocks related to fuel price volatility or disruptions in road networks.

10.3.1 Construction Output, Earnings, and Employment

Construction of Alternative 6 would require substantial capital investment in the Los Angeles Metropolitan Statistical Area (MSA). The necessary spending would increase the employment, earnings, and output for the duration of the construction period. Capital cost estimates are in 2023 dollars,

providing a common value for expenditures that would be distributed over several years. The following section describes the Alternative 6 expenditures and anticipated economic effects.

Capital expenditures for Alternative 6 are estimated at $22,693 million (2023 dollars). The breakdown of capital expenditures by category is shown in Table 10-8. Capital expenditures exclude ROW costs because purchasing ROW is not anticipated to support job creation. Acquiring and selling a property is a transfer of asset between entities, and there is no economic activity associated with it, except for small real estate/bank fees.

Table 10-8. Alternative 6: Summary of Capital Costs

Category	2023 ($M)
Design and Planning	5,655
Construction	16,537
Equipment	501
Total	**22,693**

Source: Metro, 2024b

$M = millions of dollars
Note: Capital cost estimates are exclusive of right-of-way acquisition costs

To isolate the potential economic effects of Alternative 6 on the local economy and the State of California, it is typical to distinguish between resources/funds that are new to the economy — those that would be invested in the Los Angeles-Long Beach-Anaheim MSA and/or the State of California under Alternative 6 — and resources/funds that would be spent in the region with similar economic effects (e.g., funds that would be allocated to other transportation construction projects in the area).

Two considerations determine the capital cost effects:

- Are the expenditures of the type likely to yield effects in the local economy?
- Are the funds used to make those expenditures new resources for the region?

At this stage of Alternative 6 development, the exact breakdown of funding distribution is subject to change. Alternative 6 is expected to be funded by a variety of local, state, and federal sources, including Measure M, which is a Los Angeles County voter approved, no sunset half-cent sales tax that funds projects to ease traffic, expand public transportation, and more (Metro, 2016). Measure M partially funds many Metro projects (Metro, 2016. For this analysis, 100 percent of Alternative 6 costs are treated as new funding to the region. This assumption yields an upper-limit estimate of economic output because of project construction. The actual effects post construction would likely be lower, after expenditures planned under the No Project Alternative, such as the Measure M funds, are removed. The Regional Input-Output Modeling System (RIMS II) analysis can be updated to reflect more accurate outputs after more detailed funding allocations become available. Equipment for Alternative 6 is expected to be sourced from outside the State of California. Therefore, the equipment cost category will not be factored into the effect analysis.

Each dollar of new resources is expected to yield an economic effect. Table 10-9 provides the multiplier values for the industry categories by geographic area.

Table 10-9. Alternative 6: Comparison of Regional Input-Output Modeling System Multipliers for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Industry	Final Demand Multiplier			Direct Effect	
		Output ($)	Earnings ($)	Employment	Earnings ($)	Employment
Los Angeles-Long Beach-Anaheim MSA	Design and Planning	2.0752	0.7202	9.638	1.7681	2.2741
	Construction (Tunnel, Track and Approaches)	1.882	0.4868	7.1079	1.8935	2.1094
State of California	Design and Planning	2.1309	0.7867	10.6262	1.8193	2.3616
	Construction (Tunnel, Track and Approaches)	1.9668	0.5812	8.5522	1.8995	2.1325

Source: U.S. Bureau of Economic Analysis, 2024

$ = dollars

Using the construction industry as an example, the multipliers in Table 10-9 are interpreted as follows:

- The Final Demand Output Multiplier represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction industry.
- The Final Demand Employment Multiplier represents the total change in number of jobs that occurs in all industries for each $1 million of output delivered to final demand by the construction industry.
- The Direct Effect Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the construction industry.
- The Direct Effect Employment Multiplier represents the total change in number of jobs in all industries for each additional job in the construction industry.

Applying the Final Demand Multipliers for the construction industry to the amount of funding/resources allocated for capital expenditures provides estimates of the net output, earnings, and employment effects generated by Alternative 6 in each region. The results are summarized in Table 10-10 and Table 10-11. It is important to note that these effects are one-time effects lasting for the duration of Alternative 6 construction. One job is defined as a job for one person with a duration of one year. For example, a job for one person lasting three years would be defined as three person-year jobs.

It is noteworthy that the economic effects at the MSA level and at the state level are not additive. The economic effects at the MSA level assume that the Alternative 6 costs, with the exception of vehicle costs which were removed, would be incurred entirely in the Los Angeles-Long Beach-Anaheim MSA. Likewise, the economic effects at the state level assume that the Alternative 6 costs, also with the exception of vehicle costs, would be incurred entirely in the State of California. As previously discussed in Section 3.2.1.4, this is a high estimate because 100 percent of funding is assumed to be new to the region. Similarly, the State of California outputs assume that all Alternative 6 costs are new funding within the state. Table 10-10 and Table 10-11 outline two separate scenarios and illustrate the maximum economic benefits achievable from each one. For example, Alternative 6 would not generate

166,700 person-years of employment within the MSA (Table 10-10) and 195,300 within the State of California (Table 10-11) simultaneously; these two values should be considered individually.

Table 10-10. Alternative 6: Net Effects of Capital Expenditure on the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Year Jobs)
Design and Planning	5,655	2.0752	0.7202	9.638	11,735	4,073	52,823
Construction (Tunnel, Track and Approaches)	16,537	1.882	0.4868	7.1079	31,123	8,050	113,927
Total	**22,192**				**42,858**	**12,123**	**166,750**

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the Los Angeles-Long Beach-Anaheim MSA, the construction spending for Alternative 6 is expected to generate $31,123 million in output (in 2023 dollars), $8,050 million in earnings, and over 113,900 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $11,735 million, earnings of $4,073 million, and employment of over 52,800 person-year jobs.

Table 10-11. Alternative 6: Net Effects of Capital Expenditure on the State of California

Industry	Net Capital Expenditure (2023 $M)	Final Demand Multiplier			Net Effect		
		Output	Earnings	Employment	Output (2023 $M)	Earnings (2023 $M)	Employment (Person-Year Jobs)
Design and Planning	5,655	2.1309	0.7867	10.6262	12,050	4,449	58,239
Construction (Tunnel, Track and Approaches)	16,537	1.9668	0.5812	8.5522	32,525	9,611	137,077
Total	**22,192**				**44,575**	**14,060**	**195,316**

Sources: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

For the State of California, the construction spending for Alternative 6 is expected to generate $32,525 million in output (in 2023 dollars), $9,611 million in earnings, and over 137,077 person-year jobs. Additionally, expenditures on design and planning would result in an increase in output of $12,050 million, earnings of $4,449 million, and employment of over 58,200 person-year jobs.

10.3.2 Operational Output, Earnings, and Employment

Alternative 6 is expected to generate reoccurring employment and earnings for the region in the form of operation and maintenance staff, facility operators, and maintenance expenditures. The operations and maintenance (O&M) expenditures for Alternative are expected to have a beneficial, but not substantial effect on local employment, relative to the overall employment of the region.

10.3.3 Fiscal Effects

The wages generated from Alternative 6 would boost tax revenues at the state and county levels. The middle-income tax rate of 9.3 percent was chosen for the analysis, because it covers the widest range of

middle-income households (Table 10-12), those with an annual income between $68,350 and $349,137. Due to possible spillage into other income tax brackets and accounting for the limitations of this methodology, the final income and sales tax revenue generated from Alternative 6 should be considered estimates. The assumed 9.3 percent tax rate is an upper-limit estimate. The effective tax rate would be lower than 9.3 percent due to the first $68,350 of household income being taxed at the lower tax bracket. Sales tax rates for the State of California and Los Angeles County are provided in Table 10-13.

Table 10-12. Alternative 6: State of California Income Tax Rates

Income Bracket	Income Tax Rate
$0 - $10,412	1.00%
$10,412 - $24,684	2.00%
$24,684 - $38,959	4.00%
$38,959 - $54,081	6.00%
$54,081 - $68,350	8.00%
$68,350 - $349,137	9.30%
$349,137 - $418,961	10.30%
$418,961 - $698,271	11.30%
> $698,271	12.30%

Source: California Franchise Tax Board, 2023

Table 10-13. Alternative 6: Sales Tax Rates for the State of California and Los Angeles County

Region	Sales Tax Rate
State of California	7.25%
Los Angeles County	9.50%

Source: California Department of Tax and Fee Administration, 2024

10.3.3.1 Income Tax Revenue

To calculate the additional income tax earnings for the State of California, the median income tax bracket of 9.3 percent was applied. For the Los Angeles-Long Beach-Anaheim MSA, the average income tax rate for the area was applied to the earnings generated within the MSA.

Table 10-14 shows the additional income tax generated to the MSA and state under Alternative 6. The Los Angeles-Long Beach-Anaheim MSA would generate additional income tax revenue of $1,127 million. The State of California would generate additional income tax revenue of $1,308 million. As discussed earlier in Section 10.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 10-14. Alternative 6: Additional Income Tax Generated Earnings for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings (2023 $M)	Income Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	12,123	1,127
State of California	14,060	1,308

Source: BEA, 2024; Metro, 2024b

2023 $M = millions in 2023 dollars

10.3.3.2 Sales Tax Revenue

The incremental consumption from new earnings would also boost sale tax revenues for the MSA and state. To estimate the potential increase in sales tax, calculations should account for the portion of consumption subject to sales tax and income tax deductions, as follows:

- Consumption expenditure subject to sales tax requires the identification of the share of the consumption basket that is taxable. The categories included in the analysis represent the typical expenditure for a household in the State of California. Taxable expenditures include food away from home, alcoholic beverages, apparel and services, transportation, entertainment, and personal care products (Table 10-15). For the State, around 29 percent of consumption expenditure is subject to sales tax (U.S. Bureau of Labor Statistics, 2020) The 29 percent value is applied to both the MSA and State of California earnings to generate the expected sales tax revenue increase. A breakdown of California household annual taxable expenditures is available in Table 10-15. Household expenditures are based on the U.S. Bureau of Labor Statistics calculated average of 2.7 individuals per California household.
- After-tax earnings exclude income tax from gross earnings, as identified in Table 10-16.

Table 10-15. Alternative 6: Average Household Annual Expenditures in the State of California, 2019-2020

Category	Expenditure Means
Food away from home	$3,596.47
Alcoholic beverages	$666.20
Apparel and services	$1,738.69
Transportation	$10,499.82
Entertainment	$3,134.81
Personal care products	$813.00
Total	**$20,448.99**
Average annual expenditures	$70,830.25
Annual expenditures subject to sales tax	**29%**

Source: U.S. Bureau of Labor Statistics, 2020

Table 10-16 provides the additional sales tax generated from the MSA and state under Alternative 6. The MSA and State of California would generate sales tax earnings of $303 million and $268 million, respectively. As discussed earlier in Section 10.3.1, these increases in tax revenue are not additive and should be considered as two separate scenarios.

Table 10-16. Alternative 6: Sales Tax Revenues Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Earnings after Income Tax Deductions (2023 $M)[a]	Taxable Consumption Expenditure (2023 $M)[b]	Sales Tax Generated (2023 $M)
Los Angeles-Long Beach-Anaheim MSA	10,995	3,189	303
State of California	12,752	3,698	268

Source: BEA, 2024; Metro, 2024b

[a]This is equal to the total consumption expenditure.
[b]Figured at 29 percent of total consumption expenditure.

2023 $M = millions in 2023 dollars

10.3.3.3 Property Tax Revenue

To construct Alternative 6, it would be necessary to acquire private land and structures for easements, ROWs, parking, and station facilities. These acquisitions would remove the properties from the local tax base, which would reduce annual tax revenue.

Including temporary takes during construction and applying a conservative assumption that both partial and full takes would result in property tax loss for the full parcel, it is estimated that less than 0.18 percent of the Los Angeles County or City of Los Angeles annual property tax revenue would be impacted relative to 2023 assessed parcel values and the total 2023 property tax revenues (County of Los Angeles, 2023; Controller's Office, City of Los Angeles, 2024). The calculated revenue loss would be well below the annual change in levied taxes, which increased 5.5 percent in fiscal year 2022-2023 from fiscal year 2022-2023 (County of Los Angeles, 2023). The projected loss in tax revenues associated with Alternative 6 would not compromise the county's or city's ability to provide services or generate an adverse effect.

Additionally, proximity to public transit can increase property values in both residential and commercial real estate markets (APTA, 2019), potentially offsetting property tax loss from parcel acquisition. For example, between 2012 and 2016, residential property values near transit areas increased by 61 percent, 8 percentage points more than in non-transit areas. Commercial properties near transit performed better than other commercial properties in the region, with a 73 percent increase in property value in the transit areas versus 58 percent in the region.

10.4 Mitigation Measures

10.4.1 Construction Effects

Table 10-17 shows the additional annual employment generated in the short-term would be 0.35 percent of existing employment in the Los Angeles-Long Beach-Anaheim MSA and 0.14 percent of existing employment in the State of California. Additionally, the employment generated as a result of Alternative 6 would be distributed throughout the construction life of Alternative 6. The over 166,700 person-year jobs would not occur within the same year, smoothing the effects of Alternative 6 related employment further. Assuming a 7½ year construction timeline for Alternative 6, the alternative is projected to generate an additional 22,200 jobs annually within the MSA. Additional employment generated from Alternative 6 would be a relatively small increase in overall employment and would have a beneficial effect on the local economy. Therefore, no mitigation measures are required.

Table 10-17. Alternative 6: Employment Effects Generated for the Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area and the State of California

Region	Short-Term Employment Generated (Person-Year Jobs)	Jobs Created Annually (7½ year construction schedule)	Existing Employment (2024)[a]	Short-Term Employment Generated[b]
Los Angeles-Long Beach-Anaheim MSA	166,750	22,233	6,346,100	0.35%
State of California	195,316	26,042	18,104,800	0.14%

Source: U.S.

[a]October 2024 Total Nonfarm, Not Seasonally Adjusted
[b]Jobs Created Annually/Employment

10.4.2 Operational Effects

Annual O&M costs would be a fraction of the construction costs, which would require no mitigation measures. Therefore, there will also be no mitigation measures required for operational effects.

10.4.3 Impacts After Mitigation

No mitigation measures are required; impacts are less than significant.

11 PREPARERS OF THE TECHNICAL REPORT

Name	Title	Experience (Years)
Toni Horst	Vice President	29
Kendall Myers	Infrastructure Economist	3
Thatcher Broyles	Infrastructure Economist	1

12 REFERENCES

American Public Transportation Association (APTA), National Association of Realtors. 2019. *The Real Estate Manta—Locate Near Public Transportation*. apta.com/wp-content/uploads/The-Real-Estate-Mantra-Locate-Near-Public-Transportation.pdf.

Bureau of Economic Analysis (BEA). (2024). Regional Input-Output Modeling System (RIMS II). apps.bea.gov/regional/rims/rimsii. Accessed August 9, 2024.

California Department of Tax and Fee Administration. 2024. California City and County Sales and Use Tax Rates. July 11. cdtfa.ca.gov/taxes-and-fees/rates.aspx. Accessed July 17, 2024.

California Franchise Tax Board. 2023. 2023 Form 540 Tax Rate Schedules. ftb.ca.gov/forms/2023/2023-540-tax-rate-schedules.pdf.

City of Los Angeles Department of City Planning (DCP). 1996. *Framework Element Chapter 7: Economic Development*. Re-adopted on August 8, 2001. planning.lacity.gov/cwd/framwk/chapters/07/07.htm. Accessed October 11, 2024.

City of Los Angeles Department of City Planning (DCP). 2001. *The Citywide General Plan Framework, An Element of the City of Los Angeles General Plan.* Approved July27, 1995. Re-adopted August 8, 2001. planning.lacity.org/odocument/513c3139-81df-4c82-9787-78f677da1561/Framework_Element.pdf.

Controller's Office, City of Los Angeles. 2017. *Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2016*. February 8. irebasestorage.googleapis.com/v0/b/lacontroller-2b7de.appspot.com/o/audits%2F2022%2FFY16_CAFR.pdf.

Controller's Office, City of Los Angeles. 2021. *Preliminary Financial Report for Fiscal Year 2020-21*. October 21. controller.lacity.gov/reports/pfr2021. Accessed October 11, 2024

Controller's Office, City of Los Angeles. 2024. Revenue Forecast 2024-2025 Web Summary. controller.lacity.gov/reports/revenueforecast25. Accessed August 17, 2024.

County of Los Angeles. 2023. *Annual Comprehensive Financial Report, Fiscal Year Ended June 30, 2023*. auditor.lacounty.gov/wp-content/uploads/2024/01/Annual-Comprehensive-Financial-Report-FY-2022-2023.pdf.

Federal Reserve Bank of St. Louis. 2024. Annual State Government Tax Collections, California Release Tables: State and Local Tax Revenue. July 6. fred.stlouisfed.org/release/tables?rid=143&eid=152073&od=#. Accessed July 17, 2024.

Los Angeles County Department of Regional Planning (LA County Planning). 2022. *Los Angeles County General Plan 2035. Chapter 14: Economic Development Element.* planning.lacounty.gov/wp-content/uploads/2022/11/14.0_gp_final-general-plan-ch14.pdf.

Los Angeles County Metropolitan Transportation Authority (Metro). 2008. *Measure R Expenditure Plan*. July. metro.net/about/measure-r/, dropbox.com/scl/fi/jzu11yppo8g1eeh16nzcl/2009-MeasureR-expenditure-plan.pdf. Amended July 2021.

Los Angeles County Metropolitan Transportation Authority (Metro). 2016. *Measure M Los Angeles County Traffic Improvement Plan. Attachment A, Measure M Expenditure Plan.*

libraryarchives.metro.net/dpgtl/MeasureM/201609-proposed-ordinance-16-01-county-traffic%20improvement-plan.pdf.

Los Angeles County Metropolitan Transportation Authority (Metro). 2018. *Metro Transit-Oriented Communities Policy.* Adopted June 2018. *libraryarchives.metro.net/DB_Attachments/BP-Links/policy-2018-06-28-transit-oriented-communities-policy.pdf*.

Los Angeles County Metropolitan Transportation Authority (Metro). 2019. *Sepulveda Transit Corridor Project Final Feasibility Report*. November. *libraryarchives.metro.net/dpgtl/pre-eir-eis-reports-and-studies/sepulveda-transit-corridor/2019-sepulveda-transit-corridor-final-feasibility-report.pdf*.

Los Angeles County Metropolitan Transportation Authority (Metro). 2021. *Sepulveda Transit Corridor Project Notice of Preparation.* November 30, 2021. *ceqanet.opr.ca.gov/2021110432*. Accessed October 2024.

Los Angeles County Metropolitan Transportation Authority (Metro). 2024a. *Sepulveda Transit Corridor Alternative 2 Update*. July 3. *https://boardarchives.metro.net/BoardBox/2024/240703_Sepulveda_Transit_Corridor_Alternative_2_Update.pdf*.

Los Angeles County Metropolitan Transportation Authority (Metro). 2024b. Alternative 1, 3, 4, and 5 Capital Costs. June. Alternative 6 Capital Costs. October.

Los Angeles County Metropolitan Transportation Authority (Metro). 2025. *Sepulveda Transit Corridor Project Growth Inducing Impacts Technical Report*.

Public Policy Institute of California (PPIC). 2023. *What's Behind California's Recent Population Decline—and Why It Matters*. October. *ppic.org/publication/whats-behind-californias-recent-population-decline-and-why-it-matters/*. Accessed September 26, 2024.

Southern California Association of Governments (SCAG). 2020a. *Connect SoCal, 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).* September 3. *scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf*.

Southern California Association of Governments (SCAG). 2020b. *Connect SoCal, 2020-2045 RTP/SCS Final Connect SoCal Project List Technical Report.* *scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_project-list_0.pdf*.

Southern California Association of Governments (SCAG). 2021a. *Final 2021 Federal Transportation Improvement Program Technical Appendix*. Volume II of III. March. *scag.ca.gov/sites/main/files/file-attachments/f2021-ftip-technical-appendix.pdf*.

Southern California Association of Governments (SCAG). 2021b. *Final 2021 Federal Transportation Improvement Program. Consistency Amendment #21-05*. *scag.ca.gov/sites/main/files/file-attachments/21-05-la-finalcomparison.pdf*.

Southern California Association of Governments (SCAG). 2024a. *Connect SoCal, 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy.* April 4. *scag.ca.gov/sites/main/files/file-attachments/23-2987-connect-socal-2024-final-complete-040424.pdf*.

Southern California Association of Governments (SCAG). 2024b. *Connect SoCal, Demographics and Growth Forecast Technical Report*. Adopted April 4. scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_demographics-and-growth-forecast.pdf.

Southern California Association of Governments (SCAG). 2024c. *About Us*. scag.ca.gov/about-us#:~:text=The%20SCAG%20region%20encompasses%20six,more%20than%2038%2C000%20square%20miles. Accessed August 12, 2024.

U.S. Bureau of Labor Statistics. 2020. *Consumer Expenditure Survey: California Income Quintiles Before Taxes, 2-Year Average*. June 30, 2022. bls.gov/cex/tables/geographic/mean/cu-state-ca-income-quintiles-before-taxes-2-year-average-2020.htm. Accessed July, 17, 2024.

U.S. Bureau of Labor Statistics. 2025a. *Economy at a Glance: California.* https://www.bls.gov/eag/eag.ca.htm. Accessed January 6, 2025.

U.S. Bureau of Labor Statistics. 2025b. *Economy at a Glance: Los Angeles-Long Beach-Anaheim, CA.* https://www.bls.gov/eag/eag.ca_losangeles_msa.htm. Accessed January 6, 2025.

U.S. Census Bureau. 2021. American Community Survey 5-Year Census Tract Estimates, Tables B01003, DP04.

U.S. Department of Transportation (USDOT). 2023. *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*. December. transportation.gov/sites/dot.gov/files/2023-12/Benefit%20Cost%20Analysis%20Guidance%202024%20Update.pdf.

U.S. Environmental Protection Agency (EPA). 2023. *EPA Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances*. epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf.