

LOS ANGELES WESTSIDE EXTENSION TRANSIT CORRIDOR ALTERNATIVES ANALYSIS STUDY

> Executive Summary
January 2009

Introduction

The Metro Westside Extension has been an integral element of local, regional, and federal transportation planning since the early 1980s. Extending westward from the Los Angeles Central Business District (CBD), the Westside Extension has been the subject of in-depth technical studies and extensive community involvement during this period. Ultimately, the transit investment has been envisioned to extend toward Beverly Hills, Century City, Westwood (UCLA), West Los Angeles, and Santa Monica.

In the early 1990s, plans were underway to extend the Metro Red Line to the west. Construction was already underway on the Metro Red Line from Union Station to Westlake/MacArthur Park, to Wilshire/Western Station, and to Hollywood/Vine Station. The new planning effort to avoid the federally prohibited methane gas hazard zone—a zone that was designated in 1985 after naturally occurring methane gas caused a fire in the Fairfax District—examined options detouring south of Wilshire Boulevard. The planning for a subway in this corridor was later suspended in 1998 due to a lack of funding, including a ballot initiative that prohibited local funds from being used for subway construction. Planning began on the development of the Exposition Line and a Westside Bus Rapid Transit system instead. A Wilshire Bus Lane Demonstration Project operated successfully for

three years from 2003 to 2006 and is now being developed as a separate project.

In October 2005, at the request of Metro and the City of Los Angeles, the American Public Transportation Association (APTA) organized a Peer Review Panel of experts to reconsider the feasibility of tunneling along the federally precluded Wilshire Boulevard segment of the Westside Corridor. As a result of this review (which concluded that tunnels can be safely constructed and operated in the Wilshire Boulevard corridor), legislation was approved in Congress repealing the federal prohibition on subway construction along Wilshire Boulevard in December 2007.

In July 2006, the Metro Board of Directors authorized an Alternatives Analysis (AA) Study for all reasonable fixed-guideway transit alternatives, including the previously excluded subway alternatives, for the portion of the Westside Corridor north of the Exposition Corridor. An Early Scoping Notice to start the AA Study was issued by Metro and the Federal Transit Administration (FTA) on October 1, 2007.

Alternatives Analysis Study Purpose

An Alternatives Analysis is the first step in the FTA's New Starts Project Planning and Development process. The purpose of an AA Study is to focus on a specific transportation need (or set

of needs) in a given corridor, identify alternative actions to address these needs, and generate the information needed to select a preferred project for implementation, or a smaller set of viable alternatives for further study. During the AA process, a wide range of alternatives were identified and evaluated; the alternatives were screened against established criteria; and the most promising alternative(s) will be recommended for further evaluation in the next phase of the New Starts process. An AA typically addresses such issues as costs, benefits, environmental and community impacts, and financial feasibility.

Alternatives Analysis Study Recommendations

The AA evaluated a universe of alternatives within the Westside Extension Transit Corridor (Figure S-1). The Westside Extension Transit Corridor Study Area is in western Los Angeles County and encompasses approximately 38 square miles. The Study Area is east-west ori-

ented and includes portions of five jurisdictions: the Cities of Los Angeles, West Hollywood, Beverly Hills, and Santa Monica, as well as portions of unincorporated Los Angeles County near the West L.A. Veteran’s Administration Hospital. As illustrated in Figure S-1, the boundaries of the Study Area generally extend north to the base of the Santa Monica Mountains along Hollywood, Sunset, and San Vicente Boulevards, east to the Metro Rail stations at Hollywood/Highland and Wilshire/Western, south to Pico Boulevard, and west to the Pacific Ocean.

Figure S-1 also illustrates the more than 17 different alignments that were considered in the AA Study for several transit modes. After a multi-step evaluative process—which screened the alternatives against a wide range of criteria—the universe of alternatives was reduced to a set of the five most promising alternatives. This set of five alternatives was then evaluated on a more detailed level and further reduced to the two alternatives—Alternatives 1 and



Figure S-1 Westside Extension Study Area Universe of Alternatives

11—that are being recommended for further environmental review in the next phase of the New Starts process.

Wilshire Boulevard Alignment Heavy Rail Transit (HRT) Subway (Alternative 1)—Extends from the Metro Purple Line Wilshire/Western Station to 4th Street and Wilshire Boulevard in Santa Monica underground with 10 stations and 1 optional station (Figure S-2).

Wilshire/Santa Monica Boulevards Combined HRT Subway (Alternative 11)—Includes the full Wilshire Boulevard HRT Subway and adds a second line extending west from the Metro Red Line Hollywood/Highland Station via Santa Monica Boulevard to join the Wilshire Line in Beverly Hills. The total combined line is 17 miles long and includes 14 stations and 1 optional station (Figure S-3).

Westside Extension Study Corridor and Metro System Connections

The proposed Westside Extension would complement and extend the existing Metro transit system (Figure S-4). Since 1990, Metro has constructed a regional fixed-guideway transit system that consists of HRT, light rail transit (LRT), bus rapid transit (BRT), and commuter rail. This system currently includes more than 73 miles of Metro Rail (HRT and LRT) service and 14 miles of BRT service. In addition, the Southern California Regional Rail Authority (Metrolink) has opened more than 500 miles of Metrolink commuter rail lines serving five counties.

The existing fixed-guideway transit service in the region is complemented by the transit corridors currently under study, including: Westside, Canoga BRT, Crenshaw, Regional Connector, Gold Line Eastside Phase 2, and Mid-City/Exposition Phase 2. The Westside Extension Study Corridor would provide direct connections from the Westside of the County to all of the elements



Figure S-2 Alternative 1

S.1 First Step in the Planning Process

The AA Study represents the first step of a multi-year process that is required to complete the planning, design, and construction of a project of this magnitude. Figure S-5 depicts the major steps that are involved in this process.

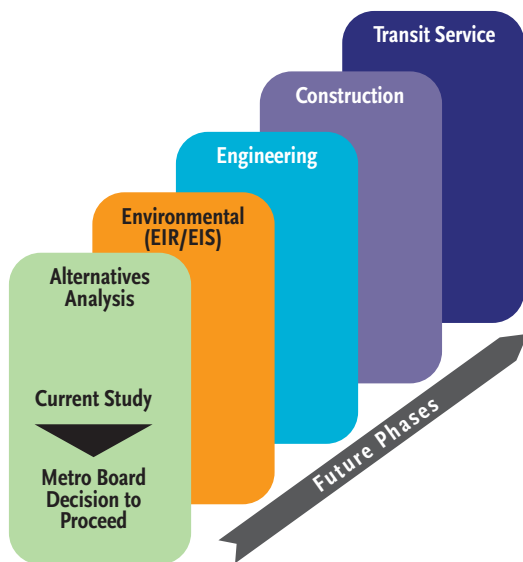


Figure S-5 Steps in Planning Process

The **Alternatives Analysis (AA)** step focuses on a specific transportation need (or set of needs) in a given corridor, identifies alternative actions to address these needs, and generates information needed to select a preferred project for implementation or a smaller set of viable alternatives for further study. Conceptual engineering drawings are prepared during an AA. These drawings, along with the scoping, screening, and evaluative efforts, allow for a wide range of alternatives to be narrowed down to the most promising alternatives. The most promising alternatives are then recommended to be carried forward into the next phase.

If the Metro Board approves the decision to proceed to the next step, then the **Environmental**

Impact Report/Environmental Impact Statement (EIR/EIS) is initiated. This step evaluates the potential environmental impacts of the project alternatives at an Advanced Conceptual Engineering level. A combined EIR/EIS allows the lead agency to simultaneously comply with both State (California Environmental Quality Act, or CEQA) and Federal (National Environmental Policy Act, or NEPA) environmental regulations. The official CEQA/NEPA Scoping is conducted, and the Draft EIR/EIS (DEIR/EIS) is prepared that presents findings of potential impacts and measures to reduce impacts on a wide range of categories. Public hearings are held on the DEIR/EIS, and then a Locally Preferred Alternative (LPA) is selected. At the conclusion of this step, Metro would apply for entry into FTA’s Preliminary Engineering (PE) phase.

If entry into the FTA PE phase is granted, the Final EIR/EIS (FEIR/EIS) is prepared at the New Starts PE level of engineering. Once the FEIR/EIS is approved, a Notice of Determination (NOD) and Record of Decision (ROD) are issued. Metro would then apply for entry into the FTA Final Design phase. This step includes right-of-way acquisition, utility relocation, and the preparation of final construction plans (including construction management plans), detailed specifications, construction cost estimates, and bid documents. The project’s financial plan is completed—which is required of all projects seeking a Full Funding Grant Agreement (FFGA) from the FTA. Metro would enter into an FFGA with the FTA and continue with Final Design.

Once Final Design is completed, Metro would begin construction of the project, perform project testing, and then initiate transit service.

Figure S-6 depicts the normal schedule for completing the phases of the New Starts pro-

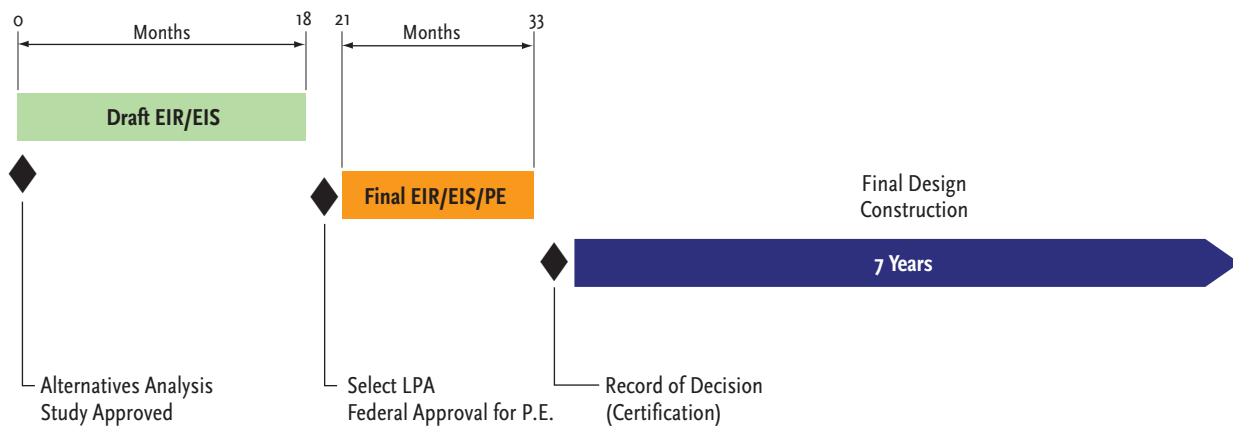


Figure S-6 Schedule for New Starts Process

cess described above. Once the AA is approved, the DEIR/EIS process would be completed in approximately 18 months. After this step is completed, a Locally Preferred Alternative (LPA) would be selected and federal approval would be sought to enter into the FEIR/EIS/PE step, which would be completed in approximately 12 months. After a Record of Decision (ROD) is issued, Final Design and construction would be completed in approximately seven years.

S.2 Need for Transit Improvements

The purpose of the Westside Extension Transit Corridor Study is to address the mobility needs of residents, workers, and visitors traveling to, from, and within the highly congested Westside Extension Study Area by providing faster and more reliable high-capacity public transportation than existing services which operate in mixed-flow traffic. The improvement in public transit service will bring about a significant increase in east-west capacity and improvement in person-mobility by reducing transit travel times.

On a county-wide level, the project will strengthen regional access by connecting Metro

bus, Metro rail, and Metrolink networks to a high-capacity transit solution serving the Study Area. The project would provide the Cities of Los Angeles, West Hollywood, Beverly Hills, and Santa Monica with improved fixed-guideway east-west transit service between the existing terminus of the Metro Red Line and Metro Purple Line near Highland Avenue and/or Western Avenue in the City of Los Angeles and Ocean Avenue in the City of Santa Monica.

Possible western extensions of the Metro Purple Line would generally follow Wilshire Boulevard (from the Metro Purple Line Wilshire/Western Station). Possible extensions from the Metro Red Line would generally follow Santa Monica Boulevard (from the Metro Red Line Hollywood/Highland Station). The overall goal of the project is to improve mobility in the Westside Extension Transit Corridor by extending the benefits of the existing Metro Red/Metro Purple Line rail and bus investments beyond their current termini.

Additional considerations supporting the project's need in the Westside Extension Corridor include the following:



Congestion

- The high concentration of regional activity centers and destinations.
- Increasing traffic congestion on the highway network, which has led to public and political support for a high-capacity transit alternative to the automobile.
- The “Centers Concept” General Plan of the City of Los Angeles, which is transit-based.
- The existing concentration of transit-supportive land uses.
- Concurrence with these land uses as supported by the City of Los Angeles/Metro Land Use Transportation Policy.
- High population and employment densities.
- Local redevelopment plans that are highly supportive of, and dependent on, high-capacity transit services.
- The existing high ridership levels on bus lines.
- Significant transit-dependent population.
- Forecasts of significant future population and employment growth.
- Existing and future travel demand patterns that demonstrate a strong and growing demand for high-capacity transit.
- Emerging travel patterns associated with a job-rich Study Area that has led to significant westbound congestion during the morning rush hours and corresponding

eastbound congestion during the evening rush hours.

- Local policy directed toward travel-demand management and transit solutions rather than expansion of the street and highway network.
- The need for transit improvements has been established in previous studies.
- Strategy to respond to climate change as mandated by California State law.

By extending the benefits of fixed-guideway transit service westward beyond the current Metro Red/Purple Line termini, the project will offer a viable alternative to driving in the heavily congested Westside Extension Transit Corridor. The mobility improvements offered by such a system will improve job accessibility for transit-dependent residents within, as well as outside, the Study Area, as well as greater Los Angeles, and improve transportation equity for all population groups. The high-quality transit solution will complement existing transit-supporting land uses and present new opportunities for mixed-use and high-density development in the Study Area.

Environmental benefits will be afforded as individuals live closer to work, cultural, and social opportunities, and trade personal vehicles for alternative transportation modes. The economic, social, and environmental benefits attributed to the project are expected to translate into public support for high quality, convenient, and reliable east-west transit service through the corridor.

Transit is Heavily Utilized

Metro is the principal transit provider in the Study Area. Table S-1 presents the growing network of transit in Los Angeles County. The Study Area is also served by Santa Monica’s Big Blue Bus, Los Angeles Department of Transportation (LADOT) DASH, LADOT

Commuter Express, Culver CityBus, and West Hollywood CityLine/DayLine, as well as Santa Clarita Transit and Antelope Valley Transportation Authority commuter services. These transit-service providers offer bus transit coverage on most major east-west and north-south arterials in the Study Area. All bus service is provided in mixed-flow lanes, subjecting bus transit to the congestion experienced by automobiles. Metro's Wilshire corridor route (Line 20/720/920), with more than 70,000 daily boardings, is recognized as one of the highest ridership bus routes in the nation.

High Levels of Congestion

Table S-2 illustrates the Los Angeles metropolitan region's unflattering distinction of being the most congested urbanized area in the nation, according to one recent study. The Los Angeles-Long Beach-Santa Ana Metropolitan Statistical Area (MSA) ranks No. 1 in annual delay per traveler, travel time index, and wasted fuel per traveler based on 2005 mobility data published by the Texas Transportation Institute in the *2007 Urban Mobility Report*. Further, the Westside Study Area has been recognized as one of the most congested areas in the greater Los Angeles region. The Study Area includes portions of the I-10 freeway, which runs east-west outside the Study Area until the Santa Monica city limits, and the I-405 freeway, which runs north-south through the Study Area just west of Westwood. These two freeways, like most freeways in Southern California, experience some of the highest levels of congestion throughout the day and particularly during the peak commute periods.

In addition, the Study Area contains some of the most congested streets in Los Angeles County. Both east-west streets—such as Wilshire Boulevard, Santa Monica Boulevard, Sunset Boulevard, Hollywood Boulevard, Olympic Boulevard, and Pico Boulevard—and north-south streets—

such as Western Avenue, Crenshaw Boulevard, La Brea Avenue, Fairfax Avenue, La Cienega Boulevard, Westwood Boulevard, Sepulveda Boulevard, Bundy Drive, and Lincoln Boulevard—operate at congested conditions throughout the day. Most of the intersections between these east-west and north-south arterials operate at or near capacity during weekday peak periods with a level of service (LOS) of E or F.

With little or no room to widen or expand roadway facilities within the Study Area, plans are being envisioned that would improve capacity and average vehicle travel speeds through Transportation System Management (TSM) strategies that make more efficient use of existing resources. For example, the City of Los Angeles is considering an initiative to convert Pico and Olympic Boulevards into a one-way pair with a contra-flow peak-period transit/van-pool lane. However, even innovative TSM projects cannot prevent the Study Area's congestion from worsening by 2030. Mobility in the Study Area is expected to decrease as the number of intersections operating at LOS E and F continues to rise.

The various transit services in the Study Area, with the exception of the Metro Rail Red/Purple Lines in the eastern portion, use the general roadway network. The major factors influencing bus-operating conditions are the traffic conditions under which the service operates, whether signal priority is available to buses, passenger loading time, and bus-stop spacing. The Study Area has substantial traffic congestion, high ridership and load factors, and closely spaced bus stops. Combined, these factors result in declining bus operating speeds over recent years.

The current average speeds of the Metro Rapid buses traveling through the Study Area range between 10 and 15 miles per hour (mph) along Wilshire Boulevard and between 11 and 14

Table S-1 Growing Network of Transit in Los Angeles County

▶ Metro HRT/LRT Lines	
Red/Purple Lines	<ul style="list-style-type: none"> • Opened in phases between 1993 and 2000 • 17.4-mile Red Line HRT extends from Union Station to west & north with two branches • Both lines run together & share 6 stations between Union Station & the Wilshire/Vermont Station • Purple Line extends westward along Wilshire Boulevard for 2 additional stations • Red Line extends for 8 additional stations through Hollywood & Universal City • Ridership for both lines = 150,000 average weekday daily boardings (Sept 08)
Blue Line	<ul style="list-style-type: none"> • Opened for service in 1990 • 22-mile LRT operates between downtown L.A. & Long Beach • Ridership = 85,000 average daily boardings (Sept 08)
Green Line	<ul style="list-style-type: none"> • Opened for service in 1995 • 20-mile LRT operates between Redondo Beach & Norwalk, primarily in median of I-105 Freeway • Ridership = 45,000 average weekday daily boardings (Sept 08)
Gold Line	<ul style="list-style-type: none"> • Opened for service in July 2003 • 13.8-mile LRT operates between downtown L.A. & Pasadena • Ridership = 26,000 average weekday daily boardings (Sept 08)
Gold Line Eastside Extension	<ul style="list-style-type: none"> • Scheduled to open for service in 2009 • 6-mile Eastside Extension will connect Union Station in downtown L.A. with Little Tokyo, Boyle Heights & East L.A. • Will operate as through running extension of Gold Line
Expo Line	<ul style="list-style-type: none"> • Scheduled to open for service in 2010 • 8.5-mile LRT Line will run along Flower Street & Metro-owned Exposition right-of-way from existing Metro Rail station at 7th Street/Metro Center in downtown L.A. to Washington/National in Culver City
▶ Metro BRT Lines/Rapid Arterial Bus Lines	
Metro Orange Line	<ul style="list-style-type: none"> • Opened for service in 2005 • 14.0-mile urban busway (BRT) extends westward across San Fernando Valley from North Hollywood end of Red Line to Warner Center • Ridership = 28,000 average weekday daily boardings (Sept 08)
Metro Rapid Arterial Bus Routes	<ul style="list-style-type: none"> • Metro has developed a predominately non-fixed guideway, rapid bus system in Los Angeles County that uses bus signal priority and additional features of BRT to create an arterial-based transit network. The first two lines of this network opened for service in 2000, and the network currently includes 26 lines. • When completed, the Metro Rapid Program will operate a network of 28 lines covering 450 miles, complementing light and heavy rail transit throughout Los Angeles County.
▶ Metrolink Commuter Rail	
Metrolink Commuter Rail	<ul style="list-style-type: none"> • Initially opened for service in 1992 • Service provided by Southern California Regional Rail Authority (Metrolink) • Connects Ventura, Los Angeles, Orange, San Bernardino, Riverside, & San Diego counties using existing rail rights-of-way • Ridership = more than 48,000 average daily boardings (Sept 08) along more than 500 miles of service

Table S-2 Key Mobility Measures (2005) for Urbanized Areas

Urbanized Areas	Annual Delay per Traveler		Travel Time Index		Wasted Fuel per Traveler	
	Hours	Rank	Value	Rank	Gallons	Rank
Los Angeles-LB-Santa Ana, CA	72	1	1.5	1	57	1
San Francisco-Oakland, CA	60	2	1.41	3	47	2
Washington, DC-VA-MD	60	2	1.37	7	43	5
Atlanta, GA	60	2	1.34	11	44	3
Dallas-Fort Worth-Arlington, TX	58	5	1.35	9	40	7
San Diego, CA	57	6	1.4	4	44	3
Houston, TX	56	7	1.36	8	42	6
Detroit, MI	54	8	1.29	21	35	10
San Jose, CA	54	8	1.34	11	38	9
Orlando, FL	54	8	1.3	17	35	10

Source: Adapted from *The 2007 Urban Mobility Report, Table 1* (Texas Transportation Institute).

mph along Santa Monica Boulevard. Figure S-7 shows the travel-time savings expected from several new and proposed fixed-guideway transit investments by comparing those values to existing mixed-flow bus service.

Regional transportation planning for Southern California's five-county area is the responsibility of the Southern California Association of Governments (SCAG), which is the Metropolitan Planning Organization (MPO) for the area. In 2007, the SCAG Regional Council adopted the Regional Transportation Plan (RTP) titled "Destination 2030" to establish the goals, objectives, and policies for the transportation system and to establish the implementation plan for transportation investments over the next 25 years. The RTP includes regional performance indicators with objectives against which specific transportation investments can be measured. Designated as one of the most congested areas in the five-county region, the Study Area will need significant improvements in these categories to meet the regional objectives for mobility, accessibility, and reliability.

The Westside is a Job Center for the Southern California Region

The Westside Study Area has the second-highest concentration of employment centers and major attractions in the Southern California region after Downtown Los Angeles. The Study Area is widely recognized as one of the preeminent employment generators in California. The greatest employment densities occur along or near the Wilshire and Santa Monica Boulevard Corridors.

Job-rich districts in the Westside rival the employment densities of many U.S. Central Business Districts (CBDs). Figure S-8 compares the total employment (in 2006 and expected in 2030) of the Westside CBD (consisting of Westwood/UCLA, Century City, and Beverly Hills) to the CBDs of a range of comparable downtowns, including San Diego, Sacramento, Phoenix, Denver, Los Angeles, Seattle, and San Francisco. Fixed-guideway transit is a key component of worker mobility for each CBD listed. This comparison shows that Los Angeles has a Westside CBD that is comparable in terms of overall employment to other downtowns in many mid-sized American cities.

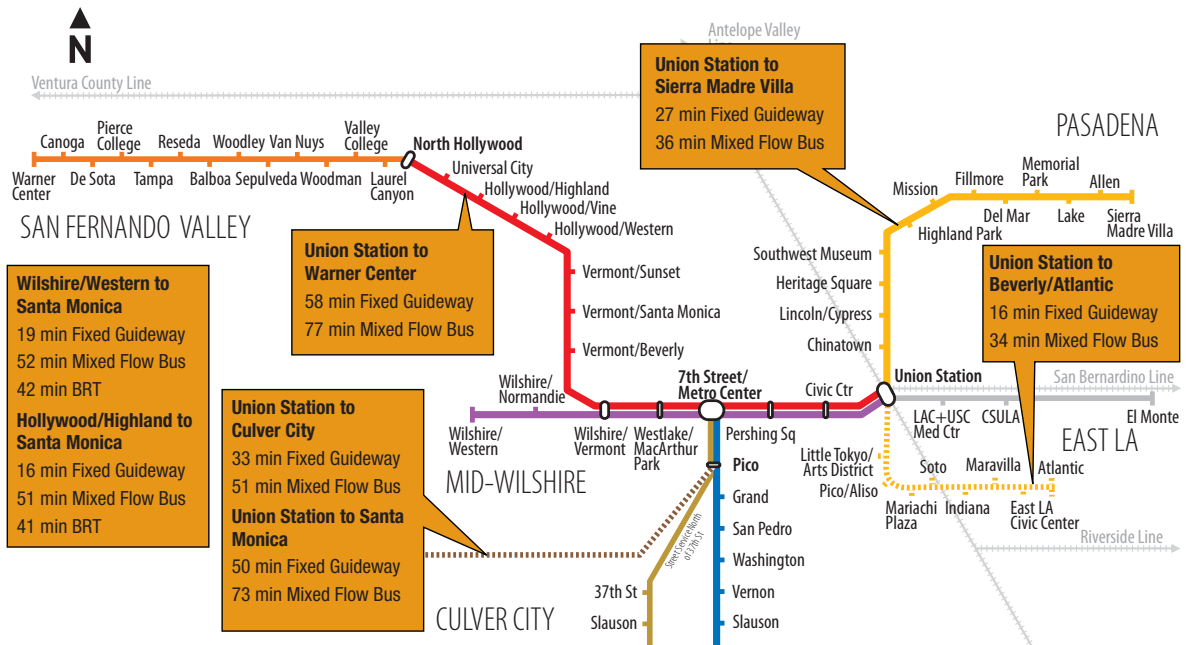


Figure S-7 Fixed Guideway and Mixed Flow Bus Travel Times for Transit Corridors

Figure S-9 compares the employment density, shown in jobs per square mile (in 2006 and expected in 2030), of the Westside CBD to the CBDs of the same cities listed above plus denser cities such as London, Tokyo, and New York. The areas comprising the Westside CBD exhibit an employment density similar to the CBDs of San Diego, Sacramento, and Phoenix, which are all served by LRT and commuter rail. While not comparable to New York City, the Westside CBD has a higher number of jobs than many mid-sized American cities and is increasing in both density and total jobs. This comparison demonstrates that employment densities exist within the Study Area to justify a fixed-guideway transit investment.

In addition to the numerous employment centers, countless local metropolitan and neighborhood centers, and many regional and world-famous cultural, entertainment, and

education facilities are located in the Study Area, as listed below.

Major Business Districts

- Koreatown (Wilshire/Vermont to Wilshire/Western)
- Century City (Santa Monica/Avenue of the Stars)
- Beverly Hills
- Westwood
- UCLA
- I-405/Olympic Boulevard area
- Downtown Santa Monica

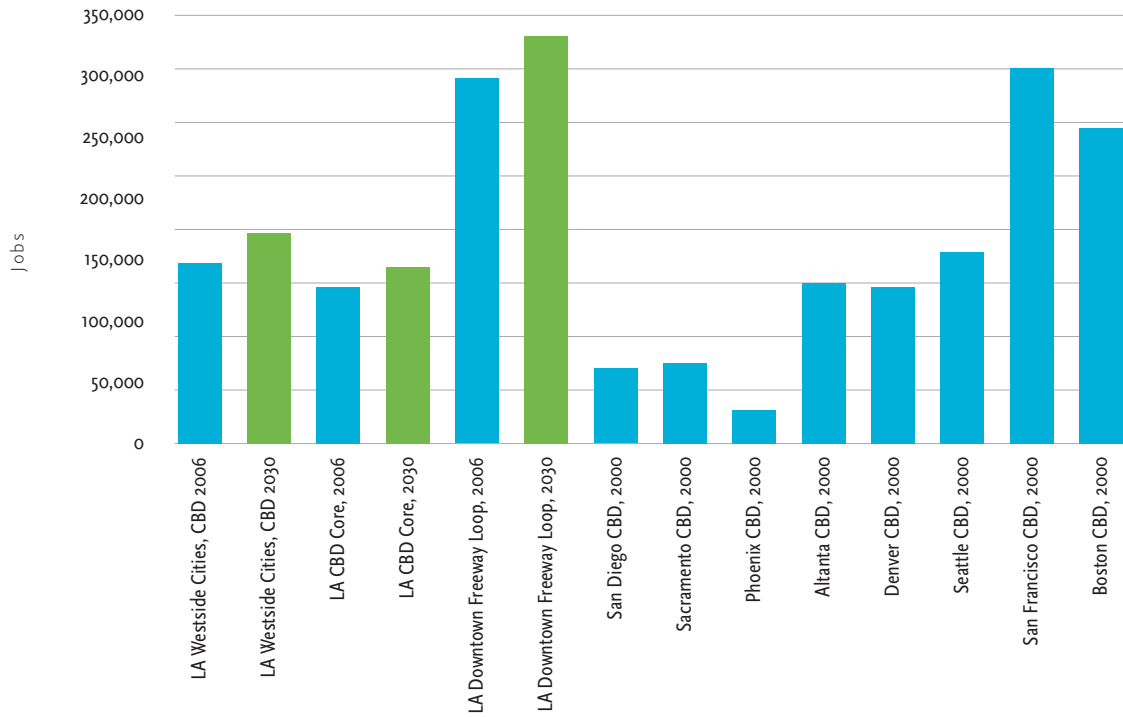


Figure S-8 Total Employment of CBDs and Westside

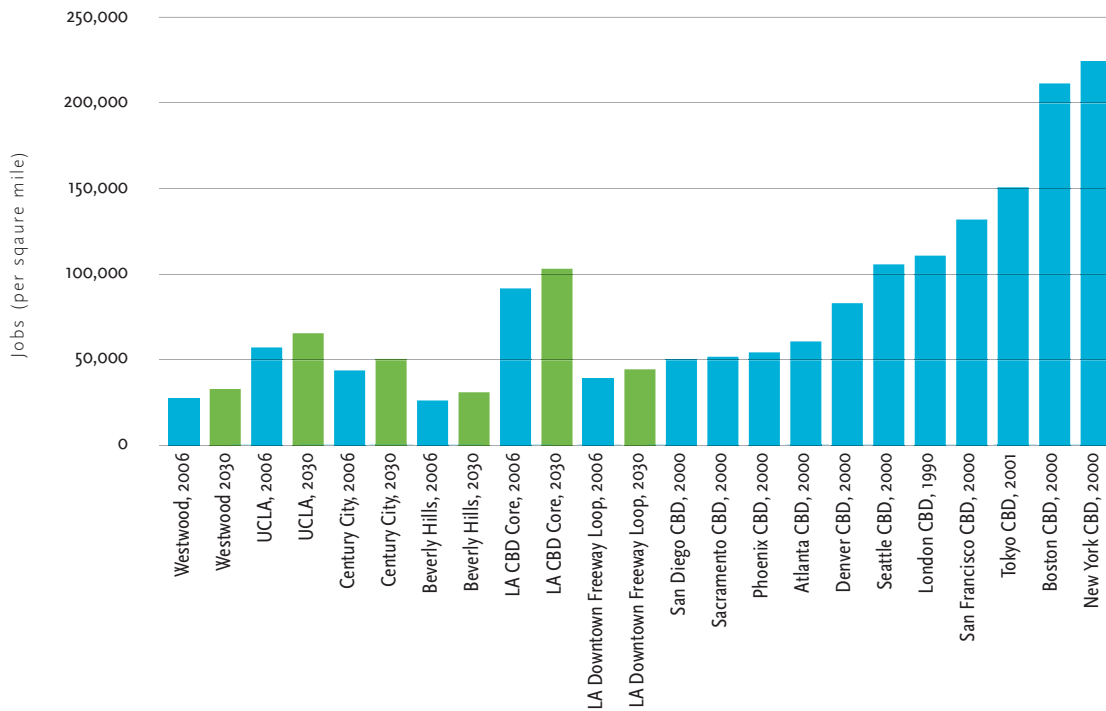


Figure S-9 Employment Densities (Jobs per Sq. Mi.) of CBDs and Westside



Wilshire Boulevard in Westwood

Retail/Entertainment Districts and Attractions

- Rodeo Drive (Beverly Hills)
- Hollywood/Highland (Hollywood Walk of Fame)
- Sunset Strip (West Hollywood)
- The Grove/Farmers Market (3rd Street/Fairfax)
- Santa Monica 3rd Street Promenade
- Santa Monica Boulevard in West Hollywood
- Westwood Village
- Beverly Center Shopping Mall (Beverly/La Cienega)
- Century City Westfield Shopping Mall
- Westside Pavilion Shopping Center (Westwood/Pico)
- Pacific Design Center

Institutional

- UCLA (research university, medical center, and hospital)

- Veterans Administration
- Cedars-Sinai Medical Center

Museums and Culture

- Los Angeles County Museum of Art
- UCLA Hammer Museum
- Peterson Automotive Museum
- Getty Center (adjacent)

Growing Population and Employment Centers

Population and employment densities in the Study Area are among the highest in the metropolitan region, averaging approximately 13,100 persons per square mile and 12,500 jobs per square mile. These high population and employment concentrations make the Study Area one of the densest places to live and work in the county.



Century City

The employment density of the Study Area is about 11 times that of Los Angeles County and about 54 times that of the entire region. It is lower than that of Downtown Los Angeles, but it is much higher than that of Long Beach and Pasadena. The greatest employment densities in the Study Area are found along the Wilshire and Santa Monica Boulevard Corridors. According to a market trend analysis by Grubb & Ellis,¹ 32% of Los Angeles County's 186 million square feet of office space is in the West Los Angeles and

¹ Araghi, Amir, 2007. *Office Market Trends Los Angeles*, Grubb & Ellis.

Mid-Wilshire areas. This amount of office space makes the Study Area one of the largest office markets in Los Angeles, although it only encompasses 38 square miles, or less than one percent, of Los Angeles County.

Approximately five percent of the population (504,000) and 10% of the jobs (479,000) in Los Angeles County are concentrated in the Study Area.

According to SCAG's forecasts, population density in the Study Area will increase to more than 14,500 persons per square mile and 14,600 jobs per square mile by 2030. This represents an increase of 10% in population density and a 17% jump in employment density.

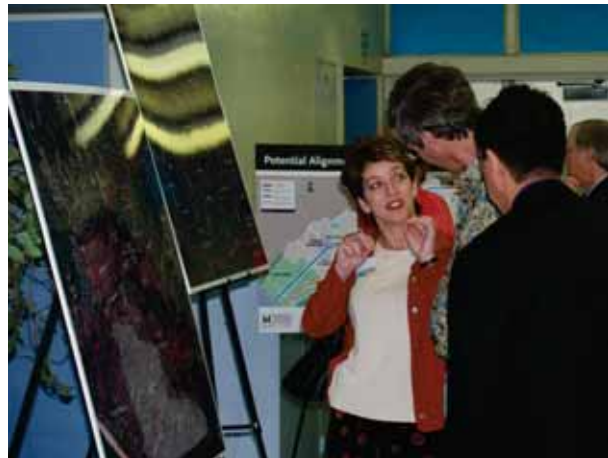
As a regional job center, the Study Area attracts a high number of daily commute trips to work from throughout the region. As shown in Figure S-10, 311,000 commute trips to work enter the Study Area every morning. During this same morning peak period, 137,000 Study Area residents leave for jobs outside the area and 88,000 commute to jobs within the Study Area. The very high number of commuters to and from jobs in the Study Area would benefit significantly from reliable, high-capacity transit service that avoids the high congestion levels that occur throughout the Study Area's roadway network.

The Westside Study Area is currently one of the largest transit markets in the region. It has 5% of the residents in Los Angeles County, yet 10% of the jobs are located here. Furthermore, 17% of all transit trips in the County start or end in the Study Area. Districts in the Study area have higher transit trip densities than the rest of Los Angeles County, with the exception of Downtown Los Angeles.

S.3 Early Scoping Meetings

Consistent with the FTA guidance for an AA, an early scoping process was used to help define the appropriate range of issues and the depth of analysis to be addressed during the AA. The intent of Early Scoping for the Westside AA was to inform the public about the project and solicit feedback on what transit improvements should be studied and how transit improvements should be evaluated. Formal public scoping will be conducted again at the start of the environmental work.

*Early Scoping Comment Period
October 1 – November 7, 2007*



Participants at Early Scoping Meetings

The Early Scoping process included the identification of prospective participants, notification for all meetings, and holding of the meetings (more details on the meetings is presented in Section S.11, Public Involvement). Official notification began with an Early Scoping notice published in the Federal Register Volume 72, No. 189 on October 1, 2007. The official scoping comment period extended until November 7, 2007. The general public and agency representatives were given the opportunity to attend public meetings. At these



Figure S-10 Travel To Westside Job Centers (Home/Work AM Peak Period Trips)

meetings, the attendees were presented with information on the basic definition of alternatives (alignment types and technology or modal types) and were then asked to provide verbal and written comments on this information. In addition, those wishing to provide comments could also view similar project information on Metro’s website and then respond in writing or by e-mail. The information provided to the public and a summary of comments received appears to the right.

Community Meeting: Westside Extension

What do you think about traffic and congestion on the Westside? Metro wants to hear from you!

Metro has just started work on the Westside Extension Transit Corridor Study which will look at ways to improve mobility on the Westside of Los Angeles. The study, which is in its first “Observation Analysis” phase, will examine potential alignments, modes and station locations throughout the 18 square mile study area.

Please attend an October public meeting for the Westside Extension Transit Corridor Study.

- Does transit need to be improved on the Westside?
- Do you prefer subways, light rail, more buses or another mode?
- Do you like a Wilshire or a Santa Monica Boulevard alignment better?
- Do you want a station in your neighborhood?
- What is important to you in evaluating these alternatives?

Please join Metro at one of five upcoming community meetings where you can comment on what you want Metro to study:

Westwood/Century City area	Hollywood/West Hollywood area	Wilshire Century/Erwinston area	Beverly Hills area	Santa Monica area
Tuesday, October 9 Erwinston Middle School	Thursday, October 11 Pico Pacific 1010 Wilshire Boulevard Los Angeles	Tuesday, October 16 Wilshire United Methodist Church 4110 Wilshire Boulevard Los Angeles	Wednesday, October 17 Beverly Hills Public Library Auditorium 444 North Arnold Drive Beverly Hills	Thursday, October 18 Santa Monica Public Library 901 Santa Monica Boulevard Santa Monica

All meetings begin at 6:00 p.m. and end at 8:00 p.m.

Content at these meetings will be identical, so make sure to attend at the time and location most convenient for you.

Comments about the study may be received at the public workshops, or by filling out the comment form on the project website, leaving a message on the information line or by writing Mr. David Mogen, AICP, Project Manager and Deputy Executive Officer, Los Angeles County Metropolitan Transportation Authority (MTA), One Gateway Plaza, Los Angeles, CA 90012. Your comments must be received by November 1, 2001.

For more information about the project study, please visit our website at <http://www.metro.net/westside> or contact the project information line at 213.922.6854.



Participants at Early Scoping Meetings

Informational Notice Distributed for Early Scoping Meetings



Participants at Early Scoping Meetings

Alignment Alternatives Presented at Early Scoping

Primary alignments were identified for consideration during the Early Scoping meetings based on previous planning studies in the Westside Extension Corridor. These general corridor alignments, depicted in Figure S-11, included the Wilshire Boulevard and Santa Monica Boulevard corridor alignments and represented street rights-of-way that could reasonably be used in an at-grade or elevated configuration and a subway configuration, and that could connect existing transit service to new activity centers with demonstrated strong transit usage. As shown in Figure S-11, the termini of the alternatives are the Wilshire/Western station at the end of the Metro Purple Line, the Hollywood/Highland station along the Metro Red Line before it turns north to the Universal City station, and Downtown Santa Monica near 4th Street and Wilshire Boulevard.

Technology Alternatives Presented at Early Scoping

The existing Metro Fixed Guideway system is comprised of Heavy Rail Transit or HRT (Metro Red Line and Metro Purple Line), Light Rail Transit or LRT (Metro Blue Line, Metro Green Line, Metro Gold Line, and Metro Expo Line, under construction), and Bus Rapid Transit or BRT (Metro Orange Line). Figures S-12, S-13,

and S-14 illustrate the range of fixed-guideway transit modes presented at the meetings that could be considered for the Westside Extension AA Study. These technologies have proven over time to be practical transit technologies that meet purpose and need, minimize environmental impacts, and are cost effective. These transit technologies were selected to carry forward into scoping for the Alternatives Analysis for evaluation against the No-Build and TSM Alternatives, which include Rapid Bus systems (Figure S-15).

Modes Presented at Early Scoping

- Heavy Rail Transit
- Light Rail Transit
- Bus Rapid Transit

Modes Suggested by Community Comments

- Monorail

Comments Received during Early Scoping

An extensive set of scoping comments were received from the public. As shown in Table S-3, comments were received on modes, stations, alignments, general issues about the study, and evaluation criteria. Based on comments received, a variety of alternative modes and alignments were suggested for consideration in addition to those presented at the scoping meetings. Those comments received that were directly related to the team's decision to add or refine the mode/alignment alternatives are presented below.

Comments on Technologies (Modes) Suggested

The comments provided by the speakers, from the written comments of attendees, e-mail comments, and letter comments at the early scoping meetings and during the official comment period, strongly supported the subway (HRT) mode (262 comments). Several commenters expressed favor for a potential monorail elevated



Figure S-11 Alignment Alternatives Presented at Early Scoping

alternative (22 comments). Several other commenters expressed support for light rail transit (18 comments). Other commenters expressed a preference for additional bus rapid transit service (14 comments).

Based on these comments, aerial monorail transit technology was added to the evaluation (Figure S-16). All other modes presented by Metro at the scoping meetings remained for screening.

Comments on Alignments Suggested

Speakers at the early scoping meetings were supportive of the Wilshire alignment (107 comments), although Santa Monica Boulevard also received support (49 comments), and many supported the combined Wilshire-Santa Monica alignments (52 comments).

A number of speakers suggested route alignment deviations from either Wilshire or Santa Monica Boulevards to serve major activity cen-

ters not located directly on those routes. These included route deviations to serve Farmers Market/The Grove, Cedars-Sinai/Beverly Center, the Sunset Strip, the University of California at Los Angeles (UCLA) campus and others.

Speakers also suggested several north-south alignments. These included an alignment from the San Fernando Valley to Los Angeles International Airport (LAX), a connection from Hollywood/Highland to the Exposition Corridor, and Burbank Airport to LAX via Hollywood/Highland. There were also comments suggesting an alignment under Burton Way, continuing east below Santa Monica Boulevard to Downtown, following Sunset Boulevard to La Cienega Boulevard, and connections to the Exposition Line either via the 3rd Street Promenade or near the Water Garden on 26th Street in Santa Monica. A group of speakers from the Spaulding Square community just east of Fairfax Avenue, between Hollywood and Sunset Boulevards, advocated



Figure S-12 Example of Heavy Rail Transit (HRT) in Subway



Figure S-14 Example of Bus Rapid Transit (BRT)



Figure S-13 Example of Light Rail Transit (LRT)



Figure S-15 Example of Metro Rapid Transit Service

Table S-3 Summary of Comments from the Early Scoping Meetings (continued on next page)

	Subway		Aerial/ Monorail		LRT		BRT		Other
	Yes	No	Yes	No	Yes	No	Yes	No	
Mode	262	8	22	1	18	8	14	22	At-grade (1) Auto expressway under Wilshire (1) High Speed Rail (1) Increase DASH service (1) Increase local service (2) Just Bus (1) More Buses (8) Moving sidewalks (1) Street Car (2) Underground BRT (1)
Stations	Century City (31) UCLA (21) Connection to Expo (14) Beverly Hills (13) North/South (12) Beverly Center (11) Santa Monica (11) Santa Monica Boulevard (11) West Hollywood (10) Beverly Center/Cedars-Sinai (9) Wilshire/Westwood (8) Avenue of the Stars (7) Constellation (7) Crenshaw (7) La Brea (7) LAX (7) Westwood (7) Beverly Triangle (6) Veterans Administration Building (6) 3rd Street (5) Beverly Drive (5) Burbank Airport (5) Fairfax (5) Grove/Farmers Market (5) La Cienega (5) Sunset/Fairfax (5) Bundy (4)		San Vicente (4) Wilshire/Fairfax (4) 405 (3) Santa Monica/ San Vicente (3) The Grove (3) Hollywood Bowl (2) Hospitals (2) Lincoln Boulevard (2) Rodeo (2) San Fernando Valley (2) Sunset/Fairfax, not (2) Westwood/LeConte (2) 17th-20th Streets (1) 20th St (1) 20th/Santa Monica Boulevard (1) 3rd/Fairfax (1) 4th Street (1) Beverly Glen (1) Century City Mall (1) Crenshaw, not (1) Crescent Heights (1) Dodger Stadium (1) Downtown (1) Echo Park (1) Fairfax, not (1) Hollywood (1) Irving, not (1)		La Brea, not (1) La Brea/Fairfax (1) La Brea/Santa Monica (1) Le Conte (1) Museum Row (1) Pacific Coast Highway (1) Pico/Fairfax (1) Red line (1) Robertson (1) Rodeo/Beverly (1) Santa Monica Community College (1) Santa Monica Pier (1) Santa Monica/Fairfax (1) Sepulveda Boulevard (1) Sunset (1) UCLA Campus (1) West of 405 (1) Western (1) Wilshire/Doheny (1) Wilshire/Gayley/Lot 32 (1) Wilshire/La Cienega (1) Wilshire/Santa Monica (1) Wilshire/Veteran (1) Wilshire/Westholm (1) Plummer Park (1) Windsor, not (1)				

Note: "Not" refers to comments received that stated a station was not wanted at that location

Table S-3 Summary of Comments from the Early Scoping Meetings (continued from previous page)

	Wilshire		Santa Monica		Both		Other	
	Yes	No	Yes	No	Yes	No		
Alignments	107	3	49	1	52	9	3rd St Promenade connection to Exposition (1) 405 (2) Burbank Airport to LAX via Hollywood (1) Burton Way (1) Don't zig-zag (1) Hollywood/Highland follow red car diagonal to Santa Monica (1) Hollywood/Highland to La Brea to Santa Monica (1) Highland (2) Hollywood/Highland (1) Hollywood/Vine to Sunset to La Cienega (1) La Brea to LAX (1) Lincoln Boulevard (1)	Must go to the Sea (4) N/S Hollywood/Highland to Expo (2) N/S Route to Valley & LAX (1) N/S Service Connections (3) Not all the way to Santa Monica (1) Olympic Boulevard (3) Provide for express trains (1) Rapid Bus on Olympic (1) San Vicente (1) Santa Monica Blvd straight to Downtown Los Angeles (1) Sunset (3) Under LA County Club (1) Wilshire to Expo via Water Garden (1)
	Issues	Noise and Vibration (16)		Signage and wayfinding (4)		External costs of driving accidents, health(1)		
		Joint development can help pay (8)		Additional land use opportunities (3)		Fire/life/safety access (what happens if a fire truck is caught at a crossing gate?)(1)		
		Tunneling under historic homes, vibration (7)		Drilling in methane area (3)		General Congestion (1)		
		Increase taxes/Fees (6)		Expand community outreach outside study area, different formats, wider demographics(3)		GPS Tracking (1)		
		System connectivity (6)		Incorporate bicycles in planning (8)		If Purple to sea, Expo on Venice (1)		
		Need N/S Connections (5)		Segment project to address funding (3)		Impacts to geologic & water table (1)		
		Parking at stations (5)		Bus Lanes (1)		Include Olympic/Pico one-way (1)		
		Traffic Diversion associated w/ BRT (5)		Concerned about noise and vibration at the Spaulding and Sunset Squares, and Sunset Flats (1)		Land use (1)		
		Need Local Connectors/Shuttles (4)		Congestion caused by buses (2)		Line naming (1)		
		Service availability (3)		Connection to LAX (1)		Park/Ride options (1)		
		Speak w/ one voice in Washington (3)		Connection with employment centers (1)		Preserve pedestrian amenities on Wilshire (1)		
		Impact on green house gasses (2)		Consider parallel arterial capacity (1)		Property values (1)		
		Economic Development opportunities (2)		Don't let funding drive schedule (1)		Questions ridership and user demographics (1)		
		Safety at stations (2)		Don't complete in phases (1)		Repair curb lanes used by buses (1)		
Shadows and visual impacts associated with elevated trains (2)		Earthquake safety (1)		Station amenities (1)				
Sunset/Fairfax station location is a business (2)		Ease of transfer (1)		Study benefits of electric vehicles (1)				
Accidents on 6th Street (1)		Environmental factors addition people on the road, train and power station exhaust(1)		System connectivity (1)				
Additional congestion to streets near stations (1)		Express service (1)		Timeliness of service (1)				
Area serviced (1)				Traffic light synchronization (1)				
Need nighttime service (4)				Underground utilities (1)				
				Use of solar power (1)				

Tables S-3 Summary of Comments from the Early Scoping Meetings (continued from previous page)

Evaluation Criteria	Additional congestion to streets near stations (1)	Express and rush hour services (1)
	Area serviced (1)	Fire/life/safety access (1)
	Benefits to community, including young people (1)	Land use (1)
	Bicycle Safety (1)	Noise and Vibration (13)
	Travel Speed (2)	Station Accessibility (1)
	Overall Capacity (1)	Station power (1)
	Construction Safety in earthquake zones (1)	System connectivity (1)
	System improvements (1)	Underground utilities (1)
	Density at stations (1)	
	Economic development opportunities (4)	

an alignment that would avoid their area as they were concerned that potential tunneling would damage their 1920s-era homes.

These comments suggest a number of possible alignment configurations. Suggested alignments to serve north-south travel were not carried into screening, however, as these did not reflect the principal east-west orientation of the study scope and many extended well outside of the study corridor.

Comments on Stations Suggested

People who spoke at the Early Scoping meetings generally supported the potential station locations that were presented and are shown on Figure S-17. However, some attendees suggested additional stations as well. Speakers suggested that a station near Cedars-Sinai Hospital and the Beverly Center was needed. Others commented that the station in Century City should be south of Santa Monica Boulevard, closer to the center of Century City. There was interest for a station on the UCLA campus and a station at The Grove/Farmers Market. There were also comments to include a station on Wilshire Boulevard between 17th and 20th Streets, near the UCLA/Santa Monica and St. John’s Hospitals. Concern was expressed by several speakers regarding a station on Wilshire Boulevard at



Figure S-16 Example of Aerial Monorail Guideway Vehicle

Crenshaw Boulevard or elsewhere in the Park Mile area of Wilshire Boulevard.

These comments suggested a variety of station location options that were tested further as part of the alternatives screening and detailed evaluation.

Summary of Substantive Comments

The overwhelming majority of comments received supported the need for a transit improvement in the Westside Extension Transit Corridor Study Area. The Wilshire subway alignment was the most favored route and mode, with nearly as many people advocating for subways on both the Wilshire and Santa Monica alignments. In many cases, where the

public supported both the Wilshire and the Santa Monica alignments, most thought that the Wilshire alignment should take precedence. Limited support was voiced for aerial/monorail, LRT, or BRT modes, with opposition to each of these modes expressed as well.

The public input in the Early Scoping process strongly favored a subway extension along Wilshire Boulevard.

S.4 Initial Definition of Alternatives

As a result of the Early Scoping process conducted during Fall 2007, 17 representative build alternatives were developed for evaluation in the AA Study (Figure S-18). In addition to the No Build and Transportation Systems Management (TSM) alternatives, the 17 alternatives are presented in five major categories:

- Wilshire Boulevard-based Heavy Rail Transit (HRT) Subway alignments

- Santa Monica Boulevard-based HRT Subway alignments
- Combined Wilshire Boulevard/Santa Monica Boulevard HRT Subway alignments
- HRT, Light Rail Transit (LRT), and Monorail elevated alignments
- Bus Rapid Transit (BRT) alignments

No Build Alternative

The No Build Alternative includes all existing highway and transit services and facilities and the committed highway and transit projects in the current Metro Long-Range Transportation Plan and the current Southern California Association of Governments' 2007 Regional Transportation Plan.

Proposed major highway improvements affecting the Westside Transit corridor between now and 2030 only include completing missing seg-



Figure S-17 Alignment Alternatives Presented at Early Scoping



Figure S-18 Universe of Alternatives that emerged from Early Scoping

ments of high occupancy vehicle (HOV) lanes on the Interstate 405 (I-405) Freeway.

From a rail transit perspective, the No Build Alternative includes the Metro Purple and Metro Red Lines along the eastern and north-eastern edges of the Study Area. Additional rail service committed in 2030 (2001 Metro Long Range Transportation Plan, Baseline) includes:

1. Metro Gold Line Eastside Extension: from Union Station to East LA;
2. Exposition LRT Line: from 7th/Metro to Culver City; and
3. LAX People Mover: from the Aviation/LAX station of the Metro Green Line to the LAX main terminal (to be funded by others).

A rich network of local, express, and Metro Rapid bus routes will also continue to be provided, with both bus route additions and modifications proposed (Table S-4).

Table S-4 Metro Rapid No Build Alternative Bus Route Additions and Modifications

Route	Line #
Santa Monica Boulevard Metro Rapid Bus	704
Culver City Bus Rapid 6	Operated by Culver City Bus
Torrance Transit Rapid 3	Operated by Torrance Transit
Manchester Avenue Metro Rapid Bus	715
Wilshire Boulevard Metro Rapid Bus	720
San Fernando - Lankershim Metro Rapid Bus	724
Olympic Boulevard Metro Rapid Bus	728
Pico Boulevard Metro Rapid Bus	730
Pico Boulevard Santa Monica Big Blue Bus Rapid 7	Operated by Santa Monica Big Blue Bus
Reseda Metro Rapid Bus	741
Central Avenue Metro Rapid Bus	753
Long Beach Boulevard Metro Rapid Bus	760
Atlantic Boulevard Metro Rapid Bus	762
Garvey Avenue – Chavez Metro Rapid Bus	770
San Fernando South Metro Rapid Bus	794
Wilshire Boulevard Metro Rapid Express Bus	920

These routes will offer an increased high quality of service in 2030 for purposes of alternative comparison.

TSM Alternative

The Transportation Systems Management (TSM) Alternative enhances the No Build Alternative and improves upon the existing Metro Rapid Bus service and local bus service in the Westside Study Area. This alternative emphasizes more frequent service to reduce delay and enhance mobility. Although the frequency of service is already very good, service frequency is proposed to be improved between 2 and 10 minutes during peak periods on selected routes.

A number of Metro local and rapid bus routes would see frequency enhancements over the No Build during the peak period (Table S-5).

Table S-5 Metro TSM Local Bus and Rapid Bus Route Enhancements

Route	Line #
Sunset Boulevard (short line (SL) Westwood)	2
Santa Monica Boulevard SL	4
Beverly Boulevard SL	14
West Third Street Limited	16
Wilshire Boulevard-Westwood	20
Vermont Avenue SL	204
Western Avenue SL	207
Santa Monica Boulevard Metro Rapid Bus	704
Wilshire Boulevard Metro Rapid Bus	720
Olympic Boulevard Metro Rapid Bus	728
Vermont Avenue Metro Rapid Bus	754

Wilshire Boulevard-Based HRT Subway Alignments

Of the 13 alternatives considered in the HRT subway category, three were focused primarily along Wilshire Boulevard. They were Alternatives 1, 12, and 14 and are described briefly below.

Alternative 1 – Wilshire Boulevard Alignment HRT Subway

- Extends from direct connection from Metro Purple Line Wilshire/Western station to 4th Street and Wilshire in Santa Monica, primarily under Wilshire, with 11 stations.



Alternative 12 – Wilshire Boulevard/Beverly Boulevard Centers HRT Subway

- Extends from Metro Purple Line Wilshire/Western station to 4th Street and Wilshire in Santa Monica, with 11 stations. Alignment is generally under Wilshire to La Brea Avenue, continues under La Brea to Beverly Boulevard, stays under Beverly to Santa Monica Boulevard, continues under Santa Monica Boulevard, transitions to Wilshire, and continues under Wilshire to 4th Street in Santa Monica.



Alternative 14 – Wilshire Boulevard/Fairfax Centers HRT Subway

- Extends from Metro Purple Line Wilshire/Western station to 4th Street and Wilshire in Santa Monica, with 12 stations. Alignment is generally under Wilshire to Fairfax, continues under Fairfax to Beverly Boulevard, to Beverly Drive and Santa Monica Boulevard, continues under Santa Monica, transitions to Wilshire, and continues under Wilshire to 4th Street in Santa Monica.



Santa Monica Boulevard-Based HRT Subway Alignments

Of the 13 alternatives in the HRT subway major category, five (plus a station approach option) were focused primarily along Santa Monica Boulevard. They were Alternatives 4, 6, 7 (and 7A), 8, and 13 and are depicted below.

Alternative 4 – Santa Monica Boulevard Alignment HRT Subway with Universal City and Hollywood/Highland Metro Red Line Connections

- Extends from Metro Red Line at Universal City and Hollywood/Highland stations to 4th Street and Wilshire in Santa Monica, with 9 stations. Underground alignment transitions from Red Line to West Hollywood at Fairfax and Santa Monica Boulevard, continues under Santa Monica to Century City, transitions to Wilshire, and continues under Wilshire to 4th Street in Santa Monica.



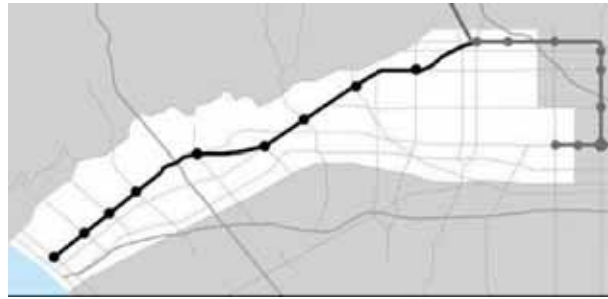
Alternative 6 – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Highland Metro Red Line Connection

- Extends from Metro Red Line at Hollywood/Highland station to 4th Street and Wilshire in Santa Monica, with 10 stations. Underground alignment transitions from Metro Red Line, continues under Highland to Santa Monica Boulevard, under Santa Monica to Century City, transitions to Wilshire, and continues under Wilshire to 4th Street in Santa Monica. A new underground transfer station near Hollywood/Highland is included to transfer to and from Metro Red Line.



Alternative 7 – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Highland Metro Red Line Connection/Galaxy North

- Extends from direct connection to Metro Red Line at Hollywood/Highland station to 4th Street and Wilshire in Santa Monica, with 9 stations. Underground alignment transitions from Metro Red Line to Santa Monica Boulevard at Fairfax north of Galaxy shopping center, continues under Santa Monica to Century City, transitions to Wilshire, and continues under Wilshire to 4th Street in Santa Monica.



Alternative 7A – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Highland Metro Red Line Connection/Galaxy South

- Extends from direct connection to Metro Red Line at Hollywood/Highland station to 4th Street and Wilshire in Santa Monica, with 9 stations. Underground alignment transitions from Metro Red Line to Santa Monica Boulevard at Fairfax south of Galaxy shopping center, continues under Santa Monica to Century City, transitions to Wilshire, and continues under Wilshire to 4th Street in Santa Monica.



Alternative 8 – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Vine Metro Red Line Connection

- Extends from direct connection to Metro Red Line at Hollywood/Vine station to 4th Street and Wilshire in Santa Monica, with 9 stations. Underground alignment transitions from Metro Red Line to Santa Monica Boulevard at Fairfax, continues under Santa Monica to Century City, transitions to Wilshire, and continues under Wilshire to 4th Street in Santa Monica.



Alternative 13 – Santa Monica/San Vicente/ Wilshire Boulevards HRT Subway

- Extends from direct connection to Metro Red Line at Hollywood/Highland station to 4th Street and Wilshire in Santa Monica, with 10 stations. Extends from Metro Red Line under Santa Monica, San Vicente, and Wilshire Boulevards to 4th Street in Santa Monica.



Combined Wilshire Boulevard/Santa Monica Boulevard-based HRT Sub- way Alignments

Of the 13 alternatives in the HRT subway major category, five represent maximum coverage alternatives using both the Wilshire and Santa Monica corridors. The five, shown below, are Alternatives 9, 10, 11, 15, and 16.

Alternative 9 – Wilshire/Santa Monica Boulevards Combined HRT Subway (Alt 1 + Alt 4)

- Extends from Metro Purple Line Wilshire/Western station and from Metro Red Line at Universal City and Hollywood/Highland stations to 4th Street and Wilshire in Santa Monica underground, with 13 stations. See Alternatives 1 and 4 for more detail.



Alternative 10 – Wilshire/Santa Monica Boule- vards Combined HRT Subway (Alt 1 + Alt 7)

- Extends from Metro Purple Line Wilshire/Western station and from Metro Red Line at Hollywood/Highland station to 4th Street and Wilshire in Santa Monica underground, with 13 stations. See Alternatives 1 and 7 for more detail.



Alternative 11 – Wilshire/Santa Monica Boulevards Combined HRT Subway (Alt 1 + Alt 6)

- Extends from Metro Purple Line Wilshire/Western station and from Metro Red Line at Hollywood/Highland station without a Metro Red Line direct connection to 4th Street and Wilshire in Santa Monica underground, with 14 stations. See Alternatives 1 and 6 for more detail.



Alternative 15 – Wilshire/Santa Monica Boulevards Combined Centers HRT Subway (Alt 13 + Alt 14)

- Extends from Metro Purple Line Wilshire/Western station and from Metro Red Line Hollywood/Highland station to 4th Street and Wilshire in Santa Monica underground, with 14 stations. See Alternatives 13 and 14 for more detail.



Alternative 16 – Wilshire/Santa Monica Boulevards Combined Centers HRT Subway (Alt 13 + Alt 14) with transfer at Hollywood/Highland

- Extends from Metro Purple Line Wilshire/Western station and from Metro Red Line Hollywood/Highland station to 4th Street and Wilshire in Santa Monica underground, with 14 stations and a transfer at Hollywood/Highland. See Alternatives 13 and 14 for more detail.



HRT, LRT, and Monorail Elevated Alignments

- Three elevated configurations (Alternatives 2, 3, and 5) were proposed for screening. For each alternative, three modes were common: HRT, LRT, and Monorail.

Alternative 2 – Wilshire Boulevard Alignment

HRT Elevated

- Extends from Metro Purple Line Wilshire/Western station to 4th Street and Wilshire in Santa Monica, with 11 stations. Alignment is elevated above Wilshire to Santa Monica Boulevard, above Santa Monica to Westwood Boulevard, above Westwood to Wilshire, and above Wilshire to 4th Street in Santa Monica. To transition from subway to elevated, alignment requires a major portal between existing Wilshire/Western Metro Purple Line station and proposed Wilshire/Crenshaw station.



Alternative 3 – Wilshire Boulevard Alignment LRT/Monorail Elevated

- Extends from Metro Purple Line Wilshire/Western station to 4th Street and Wilshire in Santa Monica, elevated with 12 stations. Alignment is elevated above Wilshire to Santa Monica Boulevard, above Santa Monica to Westwood Boulevard, above Westwood to Wilshire, and above Wilshire to 4th Street in Santa Monica. To transition from subway to elevated, alignment requires a physical transfer between existing Wilshire/Western Metro Purple Line station and proposed Wilshire/Western elevated station.



Alternative 5 – Santa Monica Boulevard Alignment HRT, LRT, Monorail Elevated

- Extends from Metro Red Line Hollywood/Highland station elevated to Wilshire and 4th Street in Santa Monica, with 10 stations. Alignment heads south from Hollywood/Highland



above Highland to Santa Monica Boulevard, above Santa Monica to Westwood Boulevard, above Westwood to Wilshire, and then above Wilshire to 4th Street in Santa Monica.

BRT Alignments

- The BRT alternative consists of a specially operated dedicated peak-period curb lanes predominantly along Santa Monica Boulevard with two branches, one to 4th Street in Downtown Santa Monica with 13 stations and the second along Santa Monica Boulevard to UCLA via Westwood Boulevard with 9 stations. The BRT alternative also includes a similarly operated Wilshire Line from the end of the Metro Purple Line along Wilshire Boulevard to Ocean Avenue, with a turn-around along Ocean Avenue back to 5th Street and Colorado Avenue in Downtown Santa Monica with 15 stations. Metro is currently evaluating dedicated bus lanes on Wilshire Boulevard in the City of Los Angeles as part of an FTA Very Small Starts Grant (separate project).

Alternative 17 – Wilshire/Santa Monica Boulevards BRT At-Grade

- Predominantly uses Wilshire and Santa Monica Boulevards on street with physical transfers at Wilshire/Western Metro Purple Line station and Hollywood/Highland Metro Red Line station. Operates with three separate lines: Wilshire to Downtown Santa Monica (Line 1, 15 stops); Santa Monica Boulevard to Downtown Santa Monica (Line 2, 13 stops); and Santa Monica Boulevard to Westwood Boulevard and Westwood Village (Line 3, 9 stops) as a branch of Line 2.



S.5 Evaluation Criteria Used for Screening Alternatives

Once the 17 alternatives described above were defined, they were evaluated through a multi-step process. Figure S-19 shows the general process used to evaluate and narrow the alternatives.

Step 1 (Screening) involves an evaluation of the alternatives on a systems planning level. The screening first focuses on answering key questions or concerns that proved to be distinguishers among major choices. The key questions related to the following:

- Vertical Alignment/Degree of Right-of-Way Separation
- Transit Mode/Technology
- Horizontal Alignment
- Ridership
- Cost-Effectiveness

Evaluating the alternatives based on these key questions helped to identify those alternatives that would best meet the goals and objectives of the project. Eliminating those that would not meet the objectives ensured that the bulk of the study effort, as well as public scrutiny and

review, was devoted to the most promising alternatives and transportation improvements. In this manner, the various transportation proposals under consideration continued to evolve as the study progressed. The alternatives not carried forward at the conclusion of each step were carefully documented in terms of the reasons they were eliminated from further consideration.

In addition to the key questions identified above, specific goals and objectives were structured to capture the priorities for mobility improvement and transit performance that have been raised and discussed by transportation planning agencies, community leaders, and concerned citizens and stakeholders for the past several years.

The established goals and objectives for the Westside Extension Transit Corridor addressed the major considerations related to making choices among different transportation alternatives, such as effectiveness in improving mobility, impacts, cost-effectiveness, financial feasibility, and equity. For the Westside Extension Transit Corridor, seven goals are used based on Federal Transit Administration (FTA) guidance.

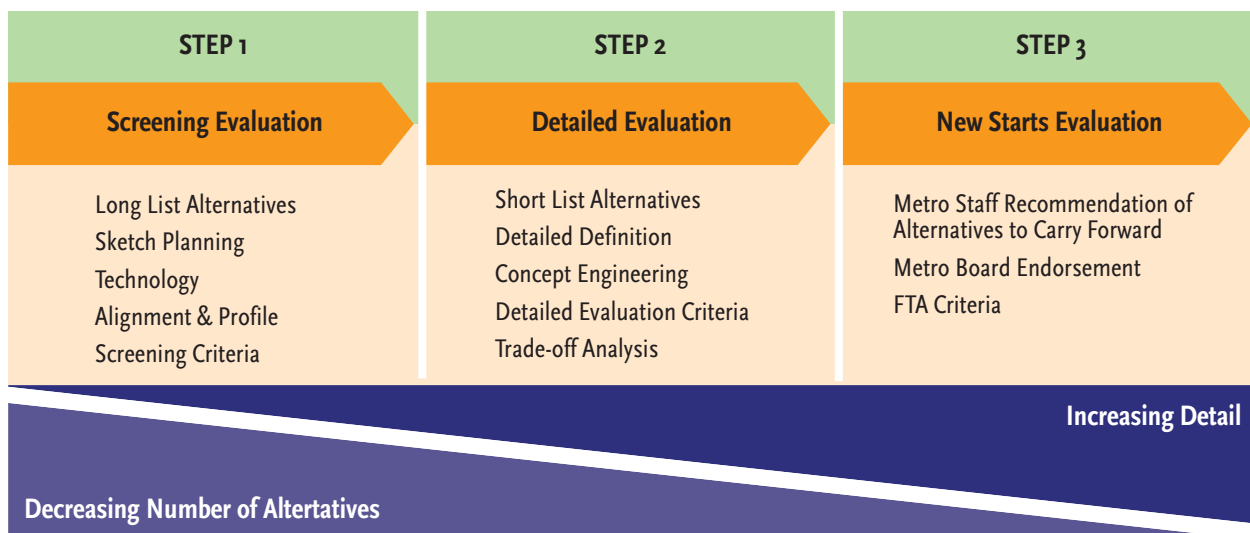


Figure S-19 Evaluation Framework

Goal A – Mobility Improvement: The primary purpose of the project is to improve public transit service and mobility in the Westside Extension Transit Corridor. To evaluate the goal of Mobility Improvement, the analysis examined how well each alternative improves the ability of residents and employees to reach desired destinations through the provision of high quality, convenient, and reliable east-west transit service throughout the corridor.

Goal B – Transit-Supportive Land Use Policies and Conditions: A major aspect of this goal is to locate transit alignments and stations in areas with existing land uses conducive to transit use or in areas that have the greatest potential to develop transit-supportive land uses.

Goal C – Cost-Effectiveness: This goal ensures that both the capital and operating costs of the project are commensurate with its benefits.

Goal D – Project Feasibility: The fourth goal is that the project be financially feasible: in other words, that funds for the construction and operation of the alternative be readily available and do not place undue burdens on the sources of those funds. This goal also includes minimizing risk associated with project construction.

Goal E – Equity: This goal evaluates project solutions based on how well costs and benefits are distributed fairly across different population groups with particular emphasis on serving transit-dependent communities.

Goal F – Environmental Considerations: The purpose of this goal is to develop solutions that minimize impacts to environmental resources and communities within the Study Area.

Goal G – Public Acceptance: This goal aims to develop solutions that are acceptable to a

reasonable portion of the public, with special emphasis on residents and businesses within the Study Area.

Performance measures were identified to measure the achievement of the goals and objectives according to a set of FTA evaluation criteria, as shown in Figure S-20.

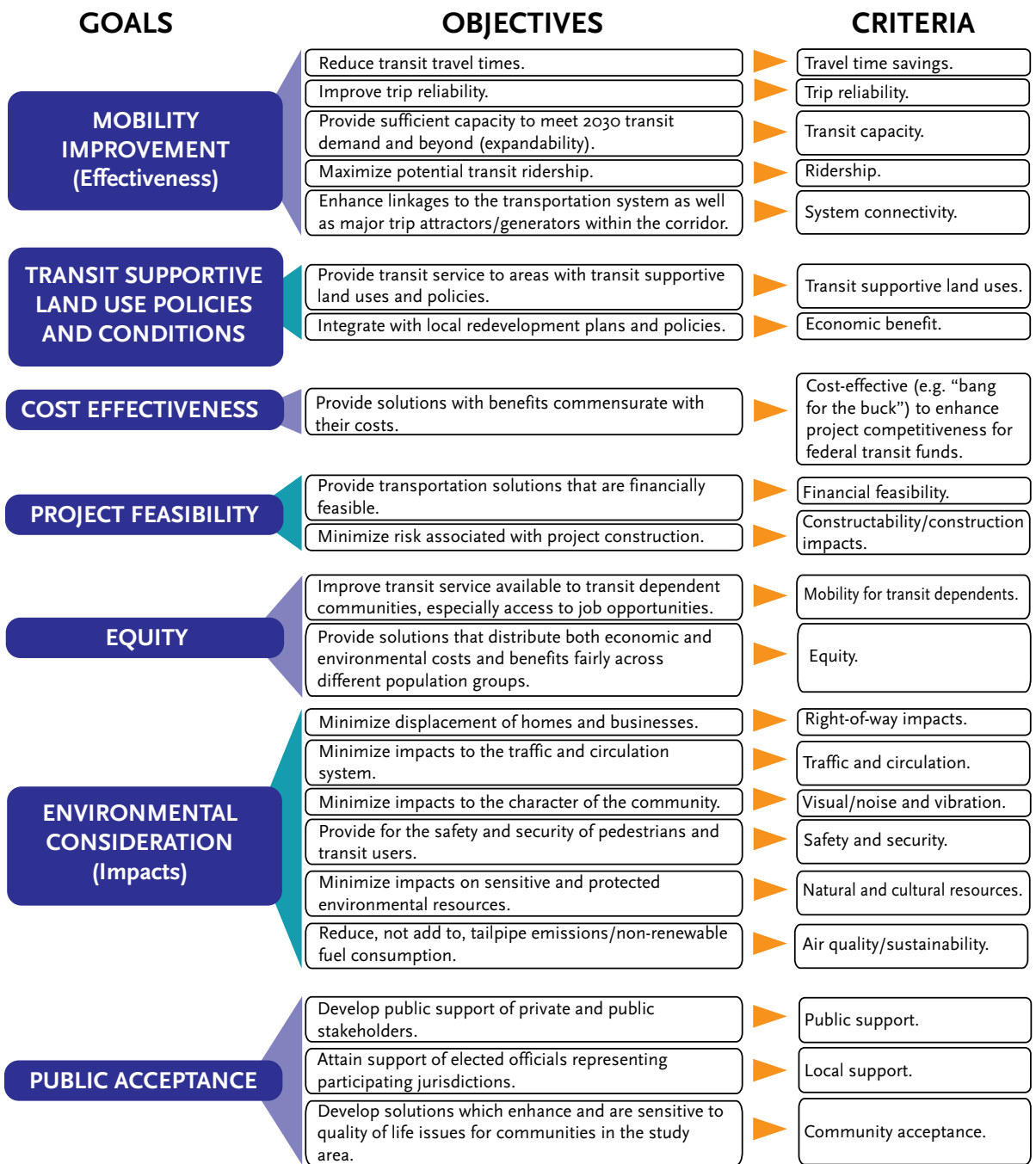


Figure S-20 Goals, Objectives and Evaluation Criteria

S.6 Initial Screening of Alternatives

Once the alternatives for the AA were defined, they were screened and evaluated through a series of steps outlined in the previous section. Specific criteria and measures were developed for each goal identified in the previous section as a means of assessing whether an alternative meets the goal. A comparative analysis among the alternatives was then conducted to determine how well each one performs against the others.

The primary purpose of the project is to improve public transit service and mobility in the Westside Extension Transit Corridor. The ability of each mode considered for the Westside Corridor was evaluated based on the carrying capacity. Figure S-21 illustrates the operating characteristics, including carrying capacity, of the various

modes. This figure assumes a common number of vehicles or trains per hour.

The Westside Corridor ridership analysis consistently demonstrated a need for a mode that could provide a capacity of more than 700 passengers per train set, as systems must be sized for the high-capacity peak period loading along the Wilshire and Santa Monica alignments. As shown in Figure S-21, LRT, Monorail, and BRT technologies provide less capacity than HRT and cannot accommodate the forecasted demand.

The pros and cons of each of these modes, along with vertical and horizontal alignments, to meet the goals and objectives of the study are discussed below.





Carrying Capacity			
Mode	Actual Operating Characteristics Normalized to 18 vehicles/hour/direction	Systems Sampled	
HRT 	Up to 800 passengers/train (6 cars) Top Speed of 70 mph (32 mph average) Up to 14,000 passenger/hour/direction	Metro Red Line Metro Purple Line	
LRT 	Up to 425 passengers/train (3 cars) Top Speed of 55-65 mph (24-35 mph average) Up to 7,600 passengers/hour/direction	Metro Blue Line Metro Green Line Metro Gold Line	
Monorail 	Up to 350 passengers/ train (6 cars) Top Speed of 40-50 mph (18-30 mph average) Up to 6,300 passengers/hour/direction	Las Vegas Monorail Seattle Monorail Disneyland Monorail Disneyworld Monorail	
BRT 	Up to 100 passengers/bus (articulated) Top Speed of 35 mph (13-22 mph average) Up to 1,800 passengers/hour/direction	Metro Orange Line Wilshire Metro Rapid	

Figure S-21 Carrying Capacity by Mode

HRT

Los Angeles is familiar with the technology behind the Metro Red and Purple Lines, and the HRT alternatives continue the use of this technology. HRT would require the expansion of the existing Metro HRT Yard or development of a new yard somewhere accessible from the existing or proposed HRT system. As HRT would be a continuation of the existing system, no transfer would be needed at the Metro Purple Line Wilshire/Western station.

A direct connection at the Hollywood/Highland station would be convenient for passengers from the San Fernando Valley. However, it may impact train operations throughout the system. A transfer station at this location may result in a minor drop in ridership. However, train operations in a push-pull configuration would be superior because a higher number of trains could operate on the Santa Monica Boulevard alignment. HRT is the highest capacity system of those studied and has the most potential for future capacity expansion.

LRT

With three existing systems in operation in Los Angeles (Metro Blue, Green, and Gold), LRT is a familiar technology. However, with two LRT lines under construction and others being studied, existing maintenance yards are reaching capacity. A new maintenance yard would be needed on the Westside to support an LRT on Wilshire Boulevard.

Because this technology differs from the HRT currently terminating at the Metro Purple Line Wilshire/Western station, a transfer would be needed at this location, which may affect ridership and travel times. LRT capacity is not as high as HRT and may be unable to accommodate the forecasted ridership within the Westside Transit Corridor.

Monorail

While not a part of the Los Angeles Metro system, Monorails are in operation in several U.S. locations, including Seattle, Las Vegas, airports, and theme parks. This technology requires the construction of a dedicated maintenance facility (estimated to be approximately 15 acres in size) on the Westside. Also, the introduction of a new, unfamiliar technology would require construction of new storage and maintenance facilities, as well as additional training and less cross-utilization of Metro train operators.

Because this technology differs from the HRT currently terminating at the Metro Purple Line Wilshire/Western station, a transfer would be needed at this location, which may affect ridership and travel times. The capacity of a Monorail system is similar to that of LRT.

BRT

BRT is the lowest cost mode studied; however, it would not be in an exclusive right-of-way. Dedicated bus lanes would help to speed buses; however, dedicated bus lanes would still have shared driveways, right-turning vehicles, and all intersections. Therefore, the ridership and travel time savings are significantly lower than that would be with the rail alternatives.

Because this technology differs from the HRT currently terminating at the Metro Purple Line Wilshire/Western station, a transfer would be needed at this location, which may affect ridership and travel times. The system capacity of BRT is significantly lower than that of HRT, LRT, or Monorail systems. BRT systems typically have lower capital costs than fixed-rail guideways.

Summary

HRT was identified as the preferred mode for further study because it has the capacity to meet the anticipated ridership demand and limit the num-

ber of transfers. BRT was also selected for further study because of its comparatively lower cost.

Vertical Alignment Issues

Elevated Alignments

While aerial structures can be less costly to build in low-density areas with available right-of-way than subway tunnels, a number of factors within the Westside Extension Transit Corridor make aerial alignment alternatives undesirable for this Study Area:

- Column placement would require the removal of two to three traffic lanes. This would result in major traffic impacts and conflicts with the project objective to add capacity to the corridor.
- To mitigate traffic impacts associated with the removal of two to three traffic lanes, and to accommodate station elevators and escalators, right-of-way would need to be purchased on one or both sides of the alignment. This cost is prohibitive. Additionally, existing buildings and land uses would be affected.
- Land use impacts are high in station areas (for stations and ancillary operations structures) and for traffic mitigation.
- There would be visual, noise and vibration, and shadow impacts, along with potential impacts to sightlines of historic structures.
- An engineering analysis developed several conclusions regarding aerial alignments and the three proposed technologies. Aerial guideways and stations for HRT, LRT, and monorail are very similar. There are no significant differences in sizes or costs when designing a system using similar aerial U.S. systems as guidance. A typical cross-section of an elevated system is shown in Figure S-22. A typical cross-section of an elevated platform and station area is shown in Figure S-23.

- Cities that have fully aerial systems or systems with aerial segments include Los Angeles (Metro Blue Line, and portions of the Metro

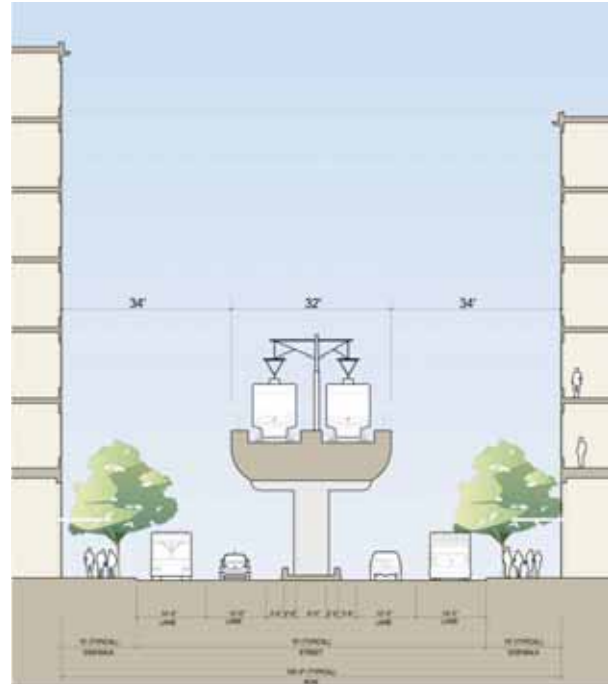


Figure S-22 Typical Cross Section: Elevated LRT

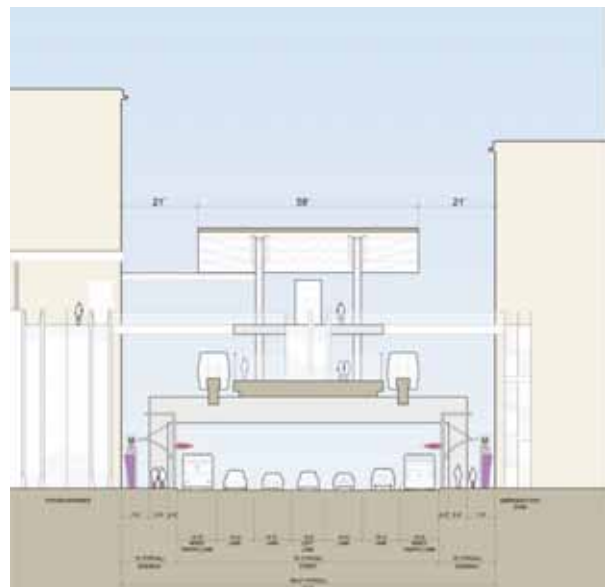


Figure S-23 Typical Cross Section: Monorail Station Platform

Gold Line LRT and Metro Green Line LRT), Las Vegas (fully aerial monorail system), and the San Francisco Bay Area (portions of the BART HRT system outside Downtown San Francisco and Oakland). The aerial LRT segments in Los Angeles are located in medium-density commercial areas and freeway medians. The aerial monorail system in Las Vegas is approximately one block off the “Strip,” maintaining a separation between pedestrian environments and the elevated structure. Land uses adjacent to the Las Vegas monorail are generally commercial/industrial. Aerial portions of BART are primarily in the East Bay and south of Downtown San Francisco along freeway corridors.

Summary

The analysis indicates that application of these aerial systems in the dense, highly urban corridors, such as Wilshire or Santa Monica Boulevards, would not be suitable; therefore they were not recommended. Figure S-24 shows the existing intersection at Wilshire and Fairfax. A photo simulation, shown in Figure S-25, illustrates how an elevated monorail station at the densely developed intersection would appear.

Subway Alignments

- In suburban and low-density urban areas, subway alignments can be less cost-effective than at-grade or elevated alignments; however, in higher density, high land price areas, tunneling can often be the most cost-effective option.
- Land use impacts are high in station areas (for stations and ancillary operations structures) and for traffic mitigation.
- While Metro endeavors to tunnel under public streets, the nature of the City’s layout and of train system design requiring wide radius curves means that occasionally tunneling occurs under private property.



Figure S-24 Photo of Existing Intersection at Wilshire and Fairfax



Figure S-25 Photo-simulation of Elevated Monorail Station at Wilshire and Fairfax

Summary

In this corridor, an underground alignment is recommended as it has fewer land use, traffic, visual, historical, and noise impacts than an elevated alignment. This is due to the impacts an elevated alignment would have on adjacent buildings (some historical), visual, shadow, noise, excessive land acquisition, traffic, and mitigations needed.

Horizontal Alignment Issues

Santa Monica Boulevard Alignments

- Stand-alone Santa Monica Boulevard subway alternatives (Alternatives 4, 6, 7, 7a, 8, and 13) did not perform as well as stand-alone Wilshire Boulevard and the combined Wilshire/Santa Monica subway alternatives.
- The transfer station at Hollywood/Highland provides superior connections to existing rail lines, resulting in improved train frequencies. It allows the option of adding a station at Santa Monica/La Brea. This applies to the combined Wilshire/Santa Monica alternatives as well.
- To support cost-effectiveness, Santa Monica HRT subway alignments may need to serve the Cedars Sinai/Beverly Center area instead of following a lower density alignment through Beverly Hills along Santa Monica Boulevard. This required some modifications to Alternatives 9, 10, and 11.

Wilshire Boulevard Alignments

- High ridership and travel-time savings offset relatively high costs, resulting in an overall good cost-effectiveness performance. High costs may require phased development of this alternative because of funding limitations.
- Alternative 1 does not provide direct service to Farmer's Market/The Grove or Cedars Sinai/Beverly Center, but generally minimizes tunneling beneath private property.
- Alternative 12 does not serve major activity centers of the Los Angeles County Museum of Art (LACMA), Farmer's Market/The Grove, and misses the City of Beverly Hills' preferred station location at the intersection of Wilshire Boulevard and Beverly Drive.
- Alternative 14 requires reconfiguration because of the inability to locate stations at LACMA and Farmer's Market/The Grove on tight turns. This can be designed, but requires

some alignments under residential and commercial properties on large radius turns.

- The Greater Wilshire Neighborhood Council requested, during the public comment period, that the Wilshire/Crenshaw station be reconsidered. After reviewing ridership forecasts, population and employment density forecasts, and area land uses, this station will be shown as an optional station pending further planning.

Combination Santa Monica/Wilshire Boulevards Alignments

- In terms of cost effectiveness, the combined Santa Monica/Wilshire Boulevards alignment performed better than the stand-alone Santa Monica Boulevard alignment, but not as well as the stand-alone Wilshire Boulevard alignment. High costs may require phased development of a combination alternative because of funding limitations.
- The transfer station at Hollywood/Highland provides superior connections to existing rail lines, resulting in improved train frequencies. It allows the option of adding a station at Santa Monica/La Brea, and it avoids most of the tunneling under residential areas. This applies to the Santa Monica Boulevard alternatives as well.
- To support cost-effectiveness, combined Santa Monica/Wilshire HRT subway alignments were reconfigured to serve the Cedars Sinai/Beverly Center area instead of following a lower-density alignment through Beverly Hills on Santa Monica Boulevard. This required some modifications to Alternatives 9, 10, and 11.
- Alternatives 9, 10, and 11 do not serve Farmer's Market/The Grove and require slightly more tunneling under residential areas.
- Alternatives 15 and 16 require reconfiguration because of the inability to locate stations at LACMA and Farmer's Market/The Grove on

tight turns. This can be resolved but requires some alignments under residential and commercial properties on large radius turns.

- The Greater Wilshire Neighborhood Council requested, during the public comment period, that the Wilshire/Crenshaw station be reconsidered. After reviewing ridership forecasts, population and employment density forecasts, and area land uses, this station will be shown as an optional station pending further planning.
- Westwood Homeowners requested that additional alignments be considered between Century City and Westwood. This request applies to all HRT subway alternatives.

Summary

Overall, the Wilshire Boulevard alternatives performed better than the Santa Monica Boulevard alternatives in nearly every category. The majority of public input also supported the Wilshire Boulevard alternatives over a stand-alone Santa Monica Boulevard alignment. The Combined Santa Monica/Wilshire Boulevards alignment also performed well and was supported by the community. As such, the preferred horizontal alignments for further study were the Wilshire Boulevard alignments and the Combined Santa Monica/Wilshire Boulevards alignments.

Based on the pros and cons of the alternatives discussed above, several alternatives were eliminated from further consideration. Table S-6 summarizes the reasons why 12 of the initial 17 alterna-

Table S-6 Summary of Reasons Alternatives were Dropped from Consideration

Alt.	Operations (Branching)	Environmental Issues	Land Use Issues	Low Capacity	Low Ridership/ New Transit Trips	Less Cost Effective	Alternatives Retained after Initial Screening
1							✓
2		X	X	X		X	
3		X	X	X	X	X	
4	X				X	X	
5		X	X	X	X	X	
6	X				X	X	
7	X				X	X	
7a	X				X	X	
8	X				X	X	
9	X					X	
10	X				X	X	
11							✓
12*	X						
13	X				X	X	
14							✓
15*	X						
16							✓
17							✓

*Key elements of Alternatives 12 and 15 are found in Alternatives 14 and 16, respectively.

tives were dropped from further consideration. As shown in the table, operational and environmental issues, in addition to capacity of various modes, played a role in the elimination of alternatives. Operational issues from branching of the rail lines may negatively affect train operations throughout the system. Alternatives with direct connections at the Universal City, Hollywood/Highland, and/or Hollywood/Vine stations were eliminated. Alternatives with a transfer station at Hollywood/Highland provided superior connections to existing rail lines resulting in improved train efficiencies. Environmental and land use issues at this level of screening focused on the impacts of elevated alternatives.

S.7 Screening of Most Promising Alternatives

At the conclusion of the initial screening of the 17 alternatives, the five most promising alternatives were carried forward for more detailed analysis. A description of these five alternatives

(Alternatives 1, 11, 14, 16, and 17) and the results of the more detailed analysis are presented below.

The No Build and TSM Alternatives are also included in the analysis, per FTA requirements. These alternatives are defined below (and in more detail in Section S.4).

No Build

The No Build Alternative represents the “do nothing” alternative. This alternative includes the existing transportation infrastructure, as well as the transportation projects that are committed in the current Metro Long-Range Transportation Plan and the current Southern California Association of Governments’ 2007 RTP (Figure S-26).

Table S-4 in Section S.4 lists the bus route additions and modifications for the No Build Alternative.



Figure S-26 No Build Alternative

TSM

The Transportation System Management (TSM) Alternative builds upon the No Build Alternative by enhancing the existing Metro Rapid Bus service and local bus service in the Westside study area (Figure S-27). No changes were made to the TSM Alternative as originally defined. The alternative emphasizes more frequent service to reduce delay and enhance mobility. Although the frequency of service is already very good, service frequency is proposed to be improved between 2 and 10 minutes during peak periods on selected routes.

Table S-5 in Section S.4 lists the bus-route enhancements for the TSM Alternative.

S.7.1 Definition of Most Promising Alternatives

The most promising build alternatives are defined below (and in more detail in Section S.4). A brief overview and a more detailed align-

ment map are provided in this section for each of the most promising alternatives.

Heavy Rail Alternatives

Four HRT subway alternatives and several alignment options were identified for further study based on their performance and results during the step 1 initial screening process. These alternatives are described below.

Attributes common to all HRT alternatives:

- Based on comments received from the public, the Wilshire/Crenshaw station will be optional and studied further.
- Several underground alignment options between the Wilshire/Beverly and Wilshire/Westwood stations remain for further study.

Alternative 1 – Wilshire Boulevard Alignment HRT Subway

This alternative extends underground from the Metro Purple Line Wilshire/Western station to 4th Street and Wilshire Boulevard in Santa

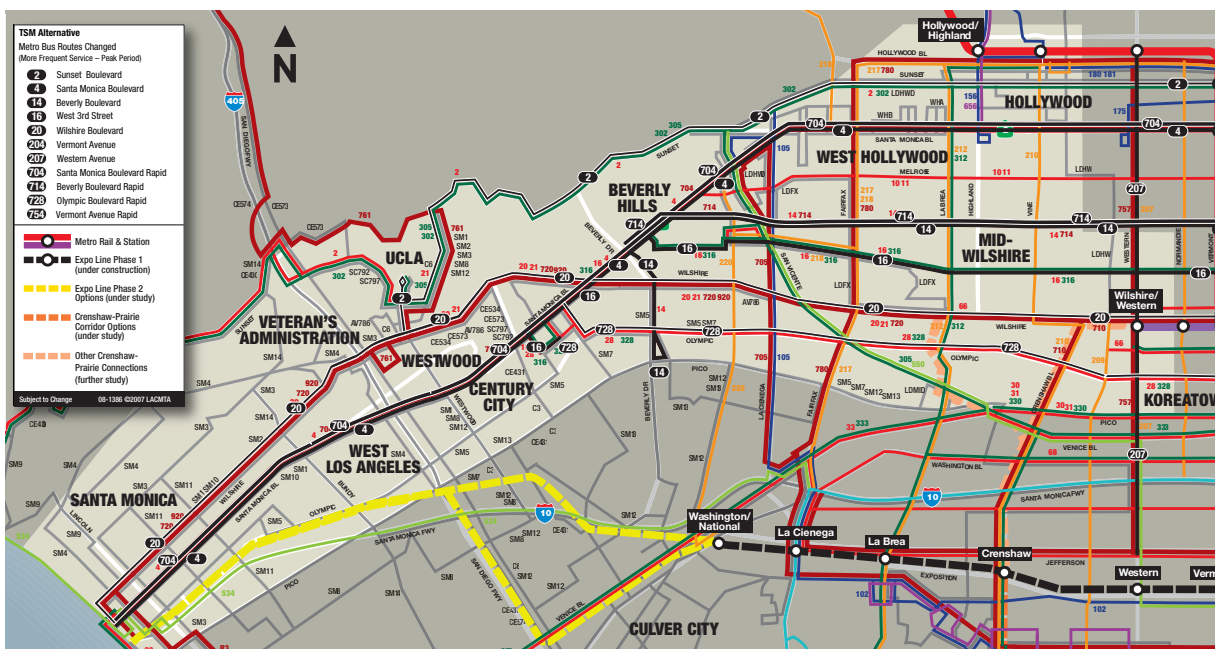


Figure S-27 TSM Alternative

Monica. It has 10 stations and 1 optional station (Figure S-28). The alignment is generally under Wilshire Boulevard with a direct connection at the Wilshire/Western station.

Alternative 11 – Wilshire/Santa Monica Boulevards Combined HRT Subway

This alternative extends underground from the Metro Purple Line Wilshire/Western station and from the Metro Red Line at the Hollywood/Highland station without a Red Line direct connection to 4th Street and Wilshire Boulevard in Santa Monica. It has 14 stations and 1 optional station (Figure S-29).

Public input received during community meetings and positive preliminary analysis results led to adding a proposed new station at Santa Monica/La Brea to the original list of stations.

Alternative 11 – Alignment Options

There are two alignment options in the Beverly Center area: Option 11A follows San Vicente

from Santa Monica Boulevard to La Cienega Boulevard, where it curves south and then west to meet the Wilshire Boulevard alignment (Figure S-30). Option 11B follows La Cienega from Santa Monica Boulevard, past the Beverly Center, and curves west at Wilshire Boulevard (Figure S-31).

Alternative 14 – Wilshire Boulevard/Fairfax Centers HRT Subway

This alternative extends underground from the Metro Purple Line Wilshire/Western station to 4th Street and Wilshire Boulevard in Santa Monica. It has 11 stations and 2 optional stations (Figure S-32).

This alignment is generally under Wilshire Boulevard to Fairfax Avenue, continues under Fairfax Avenue to Beverly Boulevard, continues under Beverly Boulevard, stays underground to La Cienega Boulevard, continues under La Cienega Boulevard, transitions to Wilshire Boulevard, and continues under Wilshire Boulevard to 4th Street in Santa Monica.



Figure S-28 Alternative 1—Wilshire Boulevard Alignment HRT Subway



Figure S-31 Alternative 11B—Wilshire/Santa Monica Boulevards Combined HRT Subway



Figure S-32 Alternative 14—Wilshire Boulevard/Fairfax Centers HRT Subway

Alternative 16 - Wilshire/Santa Monica Boulevards Combined Centers HRT Subway with Transfer at Hollywood/Highland

This alternative extends underground from the Metro Purple Line Wilshire/Western station and from the Metro Red Line Hollywood/Highland station to 4th Street and Wilshire Boulevard in Santa Monica. It has 15 stations and 2 optional stations, including a transfer at the Hollywood/Highland station (Figure S-33).

The Santa Monica Boulevard portion of the alignment transitions south under La Cienega, past the Beverly Center, and then curves west at Wilshire Boulevard. The Wilshire alignment and the Santa Monica alignment meet at approximately Beverly Boulevard, with a station located just south of the junction.

This alignment is generally under Wilshire Boulevard to Fairfax Avenue, continues under Fairfax Avenue to south of Beverly Boulevard, stays underground to La Cienega Boulevard, continues under

La Cienega Boulevard, transitions to Wilshire Boulevard, and continues under Wilshire Boulevard to 4th Street in Santa Monica.

Public input received during community meetings and positive preliminary analysis results led to the addition of a proposed new station at Santa Monica/La Brea to the original alternative.

Alternative 17 – Wilshire/Santa Monica Boulevards BRT At-Grade

This alternative predominantly uses Wilshire and Santa Monica Boulevards on street with physical transfers at the Wilshire/Western Metro Purple Line station and Hollywood/Highland Metro Red Line station. It would provide service to Downtown Santa Monica on both Wilshire and Santa Monica Boulevards (Figure S-34).

This alternative operates with three separate lines: Wilshire Boulevard to Downtown Santa Monica (Line 1); Santa Monica Boulevard to Downtown Santa Monica (Line 2); and Santa

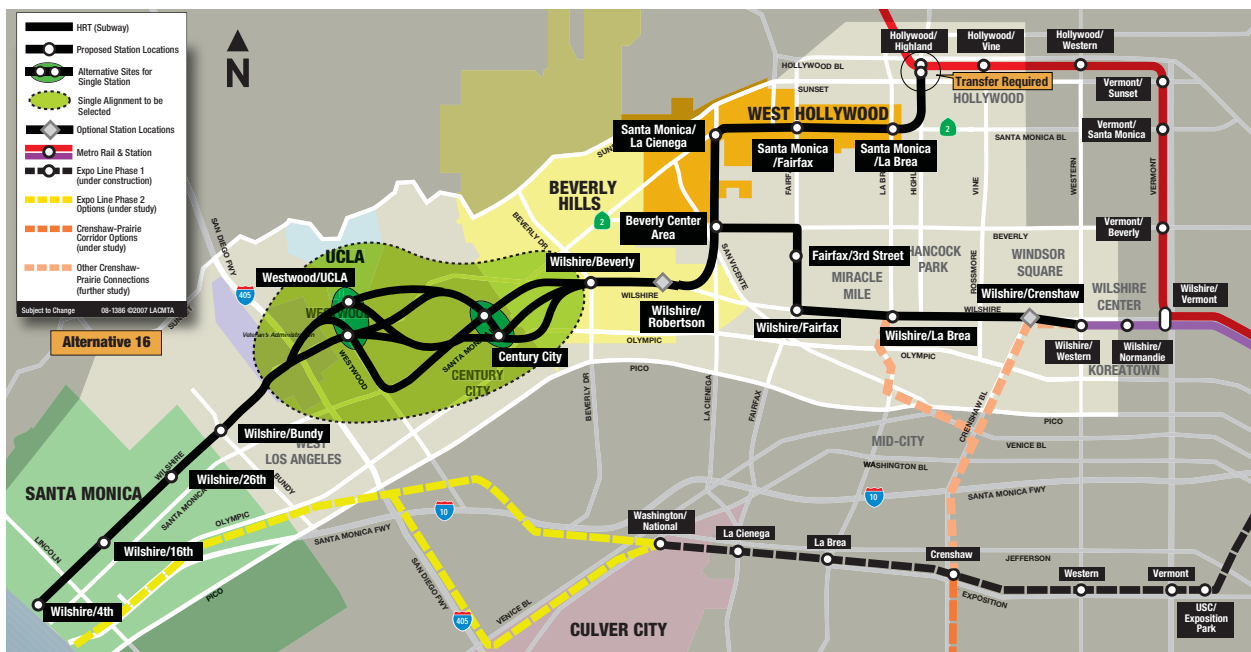


Figure S-33 Alternative 16—Wilshire/Santa Monica Boulevards Combined Centers HRT Subway with transfer at Hollywood/Highland



Figure S-34 Alternative 17—Wilshire/Santa Monica Boulevards BRT at Grade

Monica Boulevard to Westwood Boulevard and Westwood Village (Line 3) as a branch of Line 2. Line 1 has 15 stops; Line 2 has 13 stops; and Line 3 has nine stops.

S.7.2 Detailed Evaluation of Alternatives

After the five most promising build alternatives were identified, the next step was to compare the merits of each of the alternatives against the seven identified goals in order to recommend alternatives to carry into the full environmental review. The No Build and TSM Alternatives are required by the State and Federal processes to be included in the environmental review.

Mode Analysis

As with the Initial Screening and Detailed Analysis processes, one of the first steps was to evaluate the five alternatives against the Mobility Improvement goal. The major objectives of the Westside Extension Transit Corridor Study are to reduce transit travel times, improve trip reliability, provide sufficient transit capacity to meet

2030 transit demand, maximize potential transit ridership, and to enhance links to the transportation system. These mobility goals vary significantly by mode of transit.

Figures S-35 and S-36 illustrate that the Bus Rapid Transit Alternative 17 did not perform as well as the HRT alternatives under consideration across a number of these mobility measures. Figure S-35 shows that the estimated maximum capacity of the BRT was significantly less than the estimated capacity of the HRT options and only slightly more than the capacity of the No Build Alternative. The low capacity estimated for BRT limits the potential to expand the system in the future, whereas there was more flexibility with the HRT alternatives to accommodate growth in population and demand.

Likewise, Figure S-36 illustrates that the average end-to-end transit operating speed of the BRT system was significantly lower than that for the HRT alternatives. The lower operating speed

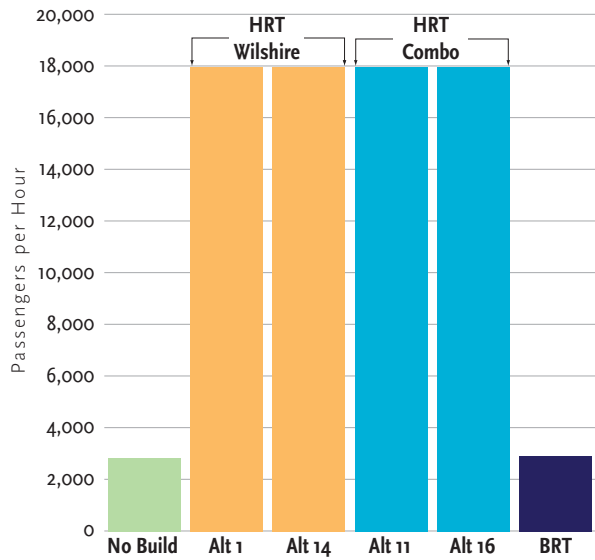


Figure S-35 Estimated Maximum Capacity of New EW Transit Service. Assuming 18 trains per hour or 30 buses per hour

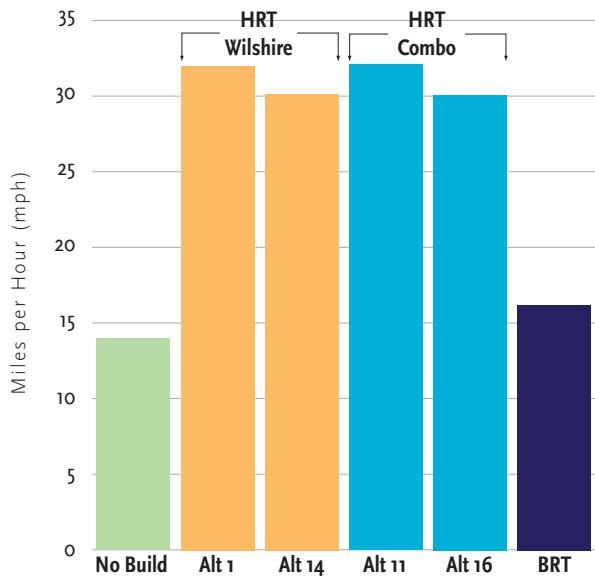


Figure S-36 Average End-to-End Transit Operating Speeds (mph) between Union Station (Downtown) and 4th/Wilshire (Santa Monica)

for BRT was because it operates in mixed-flow traffic conditions at intersections. Even with a dedicated curb lane, the BRT still needs to navigate intersections, which affects travels speeds.

Faster operating speeds indicate higher transit reliability, which means that the effectiveness and efficiency of the facility is maximized due to on-time performance. Additionally, the BRT alternative resulted in significantly fewer new transit trips than the HRT alternatives, as shown in Figure S-37.

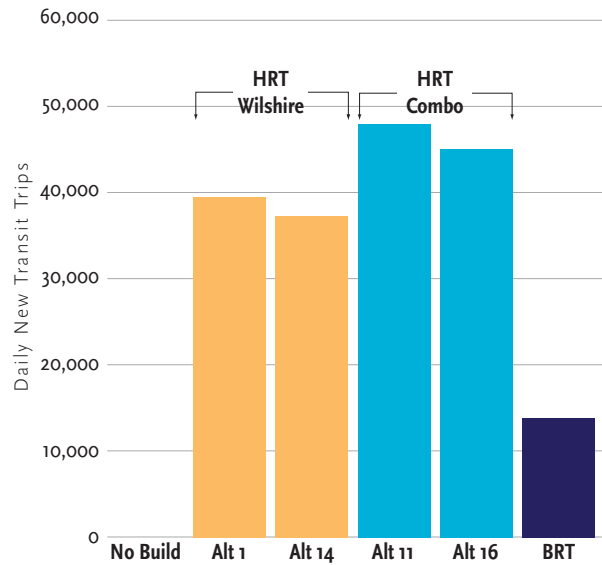


Figure S-37 Daily New Transit Trips (As compared to No Build)

Therefore, based on the considered mobility goals and the comparison to the HRT alternatives, the **Bus Rapid Transit Alternative 17 was not recommended to be carried into the next phase of analysis.** The BRT alternative is a good near-term solution but does not provide sufficient capacity in the long term and does not provide as reliable a trip-time performance as the HRT alternatives. Currently, within the City of Los Angeles, a federally sponsored program will provide peak-period bus lanes as a quality near-term solution.

Best Wilshire Alignment

The next step in the comparative analysis was to compare the two “Wilshire” alternatives (HRT

Alternatives 1 and 14) under consideration. During Step 1 of the evaluation process, a “stand-alone” West Hollywood-Santa Monica Boulevard HRT alternative was eliminated from future consideration. Therefore, a West Hollywood connection between Wilshire Boulevard and the Hollywood/Highland Red Line station must only be done in concert with a Wilshire alignment alternative. The process was to first choose the best Wilshire alternative and then add the West Hollywood segment to the best Wilshire alternative to have the best combined alternative.

Table S-7 summarizes the performance of Alternative 1 and Alternative 14 for the various criteria (see also Figure S-35 and Figure S-38 for a comparison of Alternatives 1 and 14). In comparing HRT Alternatives 1 (straight out Wilshire) and 14 (a deviation to serve the 3rd/Fairfax and the Beverly Center areas), the most significant factors favoring Alternative 1 were lower initial capital cost, more new transit trips, higher rail transit

usage, faster travel time, and more user benefits (a key Federal evaluation factor).

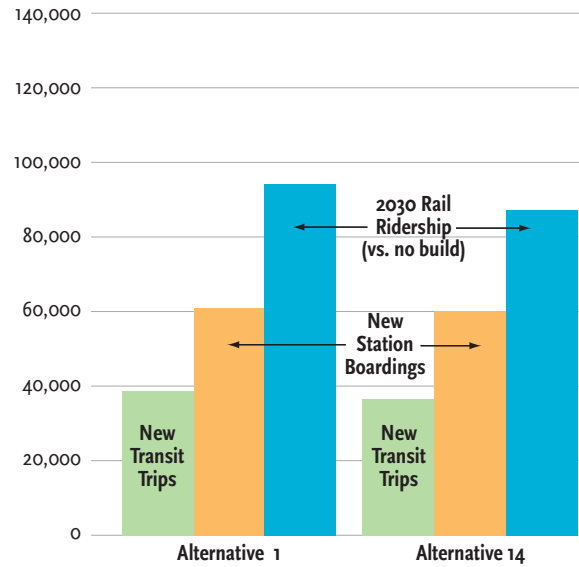


Figure S-38 Comparison of Transit Trips, New Station Boardings and Rail Ridership Projections (Alternative 1 and Alternative 14)

Table S-7 Comparison of Alternatives 1 and 14

Metric	Wilshire Alternative 1	Wilshire Alternative 14 (3rd Street Deviation)
Cost (\$2008)	\$6.1 B (shorter, fewer stations)	\$7.0 B (longer, additional stations)
New Transit Trips	39,300	37,000
New Station Boardings	61,500	59,900
2030 Rail Ridership (vs. no-build)	95,500	88,300
Travel Time Example: Downtown to Westwood	Faster (straighter) 23 minutes	Slower (curves) 28 minutes
Transit User Benefits (Travel Time Saved Compared to No Build)	48,200 hours/day	45,300 hours/day
Station Issues	Accommodates La Cienega/Wilshire	Adds stations at 3rd/Fairfax, Beverly Center Area and Wilshire/Robertson
Compatibility with Combined Alternative	Yes	Yes
Recommendation	✓ Further Study in Future Phase	✗ Eliminate

According to the estimates, Alternative 1 would cost \$900 million less than Alternative 14 primarily because of its shorter length and the fewer number of stations. Additionally, Alternative 1 would result in approximately 2,000 more new transit trips and 1,500 more new station boardings than Alternative 14. Overall rail ridership projections for the year 2030 was over 7,000 more trips with Alternative 1 than with Alternative 14. The lower ridership projection for Alternative 14 was most likely due to the longer travel time that results from the detour up to 3rd Street. Alternative 14 added approximately five minutes to the overall travel time from Downtown to Westwood. Rather than increasing ridership by locating stations near activity centers, such as the Grove and the Beverly Center, ridership actually decreased with this longer trip length because the major destinations are Beverly Center, Century City, and Westwood/UCLA. The overall user benefits of Alternative 1 were about 3,000 hours per day greater than with Alternative 14. Across all of the criteria shown in Table S-7, Alternative 1 consistently performed better than Alternative 14.

Therefore, based on all the evaluation factors presented in Table S-7 and the discussion above, **HRT Alternative 1 was recommended for future study in the next phase** and Alternative 14 was recommended to be eliminated from further consideration.

Best “Combined” Wilshire-Santa Monica Boulevard Alternative

The selection of the best Combined HRT Alternative (Alternative 11 or 16) was based on the comparative evaluation of Alternatives 1 and 14 and was therefore relatively straightforward. The combined HRT Alternative 16 includes the same alignment consideration as HRT Alternative 14 (Wilshire deviation). Since this Wilshire alignment with the detour up to 3rd Street did not perform as well as the straight alignment along

Wilshire on a number of criteria, this alignment also failed to perform as well as the straight alignment when assessing the combined alternatives.

As with the preceding comparison, Alternative 16 costs approximately \$300 million more than Alternative 11 (Table S-8). Although this is a smaller difference than in the previous comparison, it is still a significant added cost. Furthermore, Alternative 16 was projected to have lower ridership than Alternative 11 due to increased travel time. In this comparison, the user benefits of Alternative 11 exceeded the user benefits of Alternative 16 by almost 4,000 hours per day (Figure S-39).

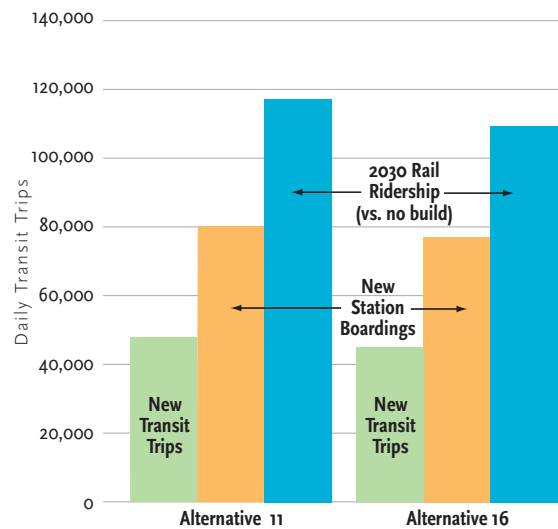


Figure S-39 Comparison of Transit Trips, New Station Boardings and Rail Ridership Projections (Alternative 11 and Alternative 16)

Therefore, Alternative 16 was recommended to be dropped from further consideration. **This left HRT Alternative 11 as the best combined alternative to study in the next phase.** Even though Alternative 11 has a high cost, it more closely meets the Purpose and Need of the Westside Extension Transit Corridor Study and

Table S-8 Comparison of Alternatives 11 and 16

Metric	HRT Combined Alternative 11	HRT Combined Alternative 16 (3rd Street Deviation)
Cost (\$2008)	\$9.0 B	\$9.4 B
New Transit Trips	47,800	44,900
New Station Boardings	80,000	77,100
2030 Rail Ridership (vs. no-build)	117,000	109,000
Travel Time Example: Downtown to Westwood	Faster (straighter) 23 minutes	Slower (curves) 28 minutes
Transit User Benefits (Travel Time Saved Compared to No Build)	57,800 hours/day	54,000 hours/day
Station Issues	Accommodates La Cienega/Wilshire	Adds stations at 3rd/Fairfax, Beverly Center Area and Wilshire/Robertson
Recommendation	✓ Further Study in Future Phase	X Eliminate

merits further analysis and consideration in the next phase.

S.7.3 Alternatives Carried Forward

Figure S-40 shows the process followed in this AA. The process began with the identification of the Initial Conceptual Alternatives and Early Scoping. Then a set of 17 initial conceptual alternatives were identified and reduced to a promising set of five alternatives. These five alternatives were then evaluated on a more detailed basis and ultimately reduced to the two alternatives (Alternative 1 and Alternative 11), plus the required No Build and TSM Alternatives, that are being recommended for further study.

Table S-9 lists all of the alternatives considered in this AA, those eliminated after the Initial Screening, those eliminated after the Detailed Evaluation, and those recommended for further environmental review.

S.8 Issues to be Resolved in EIR/EIS

During the EIS/EIR process, the following issues will need to be studied:

- Decisions about optional station at Wilshire/Crenshaw
- Details of station locations and physical alignments in West Hollywood, Century City, and Westwood
- Impacts identification and proposed mitigation measures
- Costs and possible phasing
- Evaluation of the cost-effectiveness of project elements

The resolution of these issues will lead to the selection of a Locally Preferred Alternative (LPA) and preparation of an application to FTA for advancement into Preliminary Engineering.

The cost-effectiveness of the proposed alternatives is particularly critical when applying for FTA New Starts funding. Figure S-41 illustrates where Alternative 1 and Alternative 11 currently stand in comparison with current FTA standards. In

Table S-9 Alternatives Considered in Initial and Detailed Screening Analysis

Alternatives Identified for Screening	Initial Screening		Detailed Analysis	
	Eliminated After Initial Screening	Carried Through to Detailed Analysis	Eliminated after Detailed Analysis	Recommended for Further Environmental Review
NO BUILD		○		○
TSM		○		○
▶ HEAVY RAIL TRANSIT IN SUBWAY ALTERNATIVES (13)				
Wilshire Boulevard based alignments (3)				
1 Wilshire Blvd Alignment HRT Subway		○		○
12 Wilshire Blvd/Beverly Blvd Centers HRT Subway	●	—	—	—
14 Wilshire Blvd/Fairfax Ave Centers HRT Subway		○	●	—
Santa Monica Boulevard based alignments (5, plus station option)				
4 Santa Monica Blvd Alignment HRT Subway with Universal City and Hollywood/Highland Red Line Connections	●	—	—	—
6 Santa Monica Blvd Alignment HRT Subway with Hollywood/Highland Red Line Connection	●	—	—	—
7 Santa Monica Blvd Alignment HRT Subway with Hollywood/Highland Red Line Connection/Galaxy North	●	—	—	—
7a Santa Monica Blvd Alignment HRT Subway with Hollywood/Highland Red Line Connection/Galaxy South	●	—	—	—
8 Santa Monica Blvd Alignment HRT Subway with Hollywood/Vine Red Line Connection	●	—	—	—
13 Santa Monica Blvd/San Vicente/Wilshire Blvds HRT Subway	●	—	—	—
Combined Wilshire and Santa Monica based alignments (5)				
9 Wilshire/Santa Monica Blvds Combined HRT Subway (Alt 1 + Alt 4)	●	—	—	—
10 Wilshire/Santa Monica Blvds Combined HRT Subway (Alt 1 + Alt 9)	●	—	—	—
11 Wilshire/Santa Monica Blvds Combined HRT Subway (Alt 1 + Alt 6)		○		○
15 Wilshire/Santa Monica Blvds Combined Centers HRT Subway (Alt 13 + Alt 14)	●	—	—	—
16 Wilshire/Santa Monica Blvds Combined Centers HRT Subway (Alt 13 + Alt 14) with transfer at Hollywood/Highland		○	●	—
▶ LIGHT RAIL, MONORAIL AND HEAVY RAIL ELEVATED ALTERNATIVES (3)				
2 Wilshire Blvd Alignment HRT Elevated	●	—	—	—
3 Wilshire Blvd Alignment LRT/Monorail Elevated	●	—	—	—
5 Santa Monica Blvd Alignment HRT, LRT, Monorail Elevated	●	—	—	—
▶ BUS RAPID TRANSIT ALTERNATIVE (1)				
17 Wilshire/Santa Monica Blvds BRT At Grade		○	●	—

Note: ● indicates that alternative was eliminated during that particular step in the evaluation process
○ indicates that alternative was carried through to the next step in the evaluation process

S.9 Tunnel Feasibility Assessment

The study of the feasibility of tunneling in the Westside Corridor included research in the geologic conditions in the corridor, an evaluation of appropriate tunneling technologies with a focus on tunnel boring machines (TBMs) and spoils handling, a discussion of potential station construction methods, tunnel safety, and costs associated with tunneling in this area.

Figure S-42 illustrates twin tunnel boring machines similar to those that would be used for this project.



Figure S-42 Tunnel Boring Machines used for Gold Line Eastside Extension

Special analysis was given to tunneling issues following the release of a report prepared in 2005 by the American Public Transportation Association (APTA) regarding the resumption of tunneling activities in the mid-Wilshire area. A panel of experts assembled by APTA concluded that tunnels can now be safely constructed and operated in the Wilshire Boulevard corridor, provided the following:

- Advances in TBM technologies, such as the use of Pressure Face TBMs.
- Increased local and international tunneling experience with Pressure Face tunneling.
- New knowledge about methods to mitigate risks.
- Local experience with subterranean construction along Wilshire Boulevard.
- Improvements in gas measurement and instrumentation technology.
- Successful operation of the existing Metro system within gassy ground.
- Improved attitudes with regard to safety in the industry.

S.9.1 Subsurface Conditions

The geologic units encountered within the Westside Study Area are similar to conditions encountered along existing Metro lines in Los Angeles, with the exception that petroliferous (tar) sand appears to be present within the San Pedro Formation near the La Brea Tar Pits, between approximately Fairfax and Sweetzer Avenues. The South Salt Lake Oil Field crosses Wilshire Boulevard between these two streets. The San Pedro formation would likely be encountered in portions of the tunnel excavation between Western and Fairfax Avenues based on the preliminary alignment profile grades (Alternatives 1 and 11).

In the Mid-Wilshire area, methane and hydrogen sulfide (H₂S) gases have been encountered in the San Pedro and Lakewood Formations in the likely tunnel and station areas. These gases migrate upward to the surface from deeper formations. Methane levels can reach up to 90 to 100 percent by volume of the vapor phase (the explosive range is 7 to 24 percent). H₂S has been measured in the range of 10 to 600 parts per million (ppm) in the Wilshire/Fairfax area. Safe levels for H₂S are less than 10 ppm; however, the odor threshold is much lower: on the order of 2 to 10 parts per billion. For methane, alarms are set for 10 percent of the lower explosive limit.

The City of Los Angeles has identified special building measures for Methane Risk Zones,

shown in Figure S-43, which include proper investigation of gases; construction of methane barriers/liners and vent systems beneath building slabs; special heating, ventilating, and air conditioning (HVAC) requirements; and/or methane detection and eradication equipment/systems, among other possibilities. With these measures, many high-rise buildings with deep foundations and/or subterranean parking garages have been successfully constructed and operated in the Methane Risk Zone.

Metro began developing special seismic design criteria for its underground structures in the early 1980s and has continued to update ground motion parameters for design of new structures as the California Division of Mines and Geology publishes new data, or based on findings of site-specific geotechnical investigations. Stations and tunnels are designed to structural standards for reinforced concrete structures under the various loading scenarios that include ground and

groundwater loads, earthquake loads, and the dead loads of the structure and adjacent structures as applicable. All design for seismic conditions would be further developed during subsequent project phases. For example, the Santa Monica Fault Zone with respect to the options between Century City and Westwood would need further study (Figure S-44).

Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading. Liquefaction occurs in saturated soils (soils in which the space between individual particles is completely filled with water). Some Holocene Age sediments (soils that are less than 11,000 years old) located above the groundwater level within the Study Area could undergo liquefaction when saturated. Pre-Holocene alluvial fans and sediments are less likely to undergo liquefaction in all conditions (both saturated and unsaturated).



Figure S-43 Study Alignments with Methane Risk Zone and Methane Buffer Zone



Figure S-44 Santa Monica Fault Zone

Based on the conceptual designs, the tunnels will generally be located below the Holocene Age sediments. As a result, settlement due to liquefaction is considered remote.

S.9.2 Evaluation of Tunneling Technology

The feasibility of tunneling for the Westside Extension Transit Corridor can best be determined based on comparison with past and current experience in Los Angeles and other cities around the U.S. and worldwide. That experience has shown that the proper combination of design, modern tunneling equipment and methods, and the use of sufficient ventilation leads to successful tunnel construction. Evidence of this is found in the now completed Metro Gold Line Eastside LRT tunnels and in similar successes

of other tunnel projects in the U.S., such as the North East Interceptor Sewer in Los Angeles.

Of these success stories, the Metro Gold Line Eastside Extension is most applicable because it is local and proves that tunnels can be constructed and operated in local (including gassy ground) conditions.

More modern tunneling practice (i.e., the use of earth pressure balance machines) has demonstrated great success in the gassy ground of the Boyle Heights area of Los Angeles. Preliminary analysis by the Consultant and the Metro Tunnel Advisory Panel suggests that the Westside Extension Transit Project will probably use Slurry Face Machines in the highest gas segment(s) of the project corridor and may use an Earth Pressure Balance machine elsewhere. The Eastside tunnels were designed and constructed successfully. Due to higher gas levels in the Fairfax area, additional studies will be performed during the next phases to confirm design criteria.

Evaluation of TBM Technology

There are several types of tunnel boring machines, each of which is suited to different ground conditions and construction methods.



Secant Pile Walls, Barnsdall Shaft, Hollywood



Deep Soil Mix Wall Equipment, Hollywood and Vine Station



Soldier Piles and Lagging With Cross Bracing, Mariachi Plaza, Gold Line



Slurry Wall Excavation, Portland, OR

For the original construction of the Metro Red Line, open-face tunnel boring machines (TBMs) were used. They were called open-face machines because the ground at the face of the machine was exposed to the tunnel atmosphere and relied upon soil properties, plates, jacks, or mechanical doors to attempt to stabilize the face.

For the Westside, a pressure-face, slurry-shield tunneling boring machine (SF TBM) is expected to be used for tunneling in areas where H₂S gas requires additional safety precautions during construction. Tunneling using an SF TBM minimizes exposure of workers to elevated gas concentrations underground since the excavated soil is removed in a fully enclosed slurry pipeline to an enclosed treatment plant.

Earth Pressure Balance (EPBs) tunnel boring machines are similar to SF TBMs in that the soil is excavated by a wheel and trapped at the face by a bulkhead in the machine. Removal of the soil is by means of a screw conveyor that also provides the pressure reduction (by friction) from the pressure at the face to ambient at the soil discharge point. Two EPB TBMs were used to construct the Metro Gold Line Eastside Extension.

Spoils Handling and Disposal

Tunneling operations will require worksite space for accessing the tunnel, slurry and grout plants, electrical equipment, spoils storage, dump truck access, segment storage, and other equipment storage. For SF TBMs, a slurry separation plant requires space for slurry handling and separation. Slurry processing is more difficult in clay and silty soils. Additional steps are required for separation of soil from the slurry, and sufficient plant capacity must be available to keep up with the tunnel progress. Wet materials (not fully processed) may be hauled away, but this also means additional cost. Treatment plants for slurry processing would also require air monitoring for

hazardous gases (where present) and appropriate ventilation systems.

S.9.3 Station Construction

Existing Metro stations generally have been excavated and supported using conventional methods. Typically, initial ground support has been provided by soldier piles and lagging (timber or shotcrete) followed by a cast-in-place concrete final lining. Exceptions to this have been at Union Station, where slurry walls were used to reduce the need for groundwater treatment, and at the Hollywood/Vine Station, where a deep soil mixing technique was used for initial support. For final walls, all stations have been wrapped with High Density Polyethylene (HDPE) to exclude gas. This construction has occurred successfully in ground containing methane and/or H₂S.

Underground Construction in Methane Zone

In addition to Metro stations and other Metro structures, there is now an extensive history of construction in the Westside geology. This includes parking garages successfully excavated and completed in ground containing methane and H₂S that extended to depths similar to those anticipated for the Westside Project. The APTA panel noted, “no problems with deep basements along Wilshire Boulevard,” referring to new construction in the Methane Risk Zone since 1985. Several other projects, including those at LACMA, constructed in the Methane Risk Zone were reviewed during this study to determine if problems with gas or tar occurrences have been reported during operations and if any construction issues could be verified. The initial review found no gas detected in existing underground parking garages. During construction of the new LACMA underground parking garage, H₂S gas was encountered such that workers had to occasionally wear Personal Protective Equipment.

Subterranean construction (parking garages) in the Methane Risk Zone has been conducted to depths exceeding 50 feet below street level. Many of these structures are within the Methane Risk Zone. Typically, deep excavations use traditional tie-back soldier pile and construction lagging methods. These excavations addressed the challenges of shallow groundwater and of protecting adjacent buildings and streets against settlement (subsidence).

Potential Construction Methods – Metro Stations

Given the success of existing Metro stations and other structures in the Methane Risk Zone, it is possible that similar methods can be used for the Westside project. Because gas levels are expected to be higher than previously encountered, provisions for additional redundancy to ensure no leakage will need to be considered in the most gassy areas, such as the Wilshire/Fairfax station. Station construction methods will be selected based on the ground conditions (soil, water, and gas) and the requirements for the final structure.

Subsequent studies during preliminary and final design would be undertaken to evaluate the best alternative for leak prevention, detection, and repair. Design and construction methods would need to be developed to ensure system safety and reliability in the challenging environmental conditions. In addition to the hazardous subsurface gasses, design must also address effects resulting from seismic shaking.

Operations

Operational safety and procedures will be developed that depend on the alternative selected, subsurface conditions encountered, and advances in equipment and technology in the years prior to construction. Basic operations are likely to be similar to those of existing Metro systems that are designed for locations where gas is known to be present, which include the following:

- Design to exclude gasses through use of barriers such as HDPE barriers and reinforced concrete wall systems.
- Inspection and testing during construction to ensure quality for the concrete placements and barrier construction and to minimize leakage into the structure.
- Installation of ventilation systems capable of purging gas to safe levels. These systems are also used for exhaust smoke in case of fire.
- Installation of gas detection and monitoring equipment to warn if gas levels approach pre-set alarm levels and to automatically activate additional ventilation.
- Provisions for air-flow during non-revenue service to prevent gas accumulation.
- Inspection and maintenance programs for all of the above.

S.9.4 Cost Methodology Differential

Technical reviews prepared for the AA Study evaluated differential costs for tunneling in areas having elevated methane levels. The differential cost consists of additional structure elements and labor required to address the higher expected levels of methane exposure for twin (two) tunnels. The costs included use of Slurry TBMs, potential for a second tunnel lining, and reduction in excavation rates in contaminated soil. Note that these costs do not constitute a bottom-up cost analysis. For the overall estimate, these costs may be added to the unit costs developed for the AA Study cost estimates. The differential was found to be approximately \$9 million per station and between \$600 to \$1,800 per linear foot for the tunnels. The higher end of the range was used for the capital cost estimate.

S.9.5 Paleontological Resources

The potential for encountering paleontological resources (sites of fossils or ancient life forms) is related in part to the depth of the tunnel in relation to the type of subsurface soil and rock strata (stratigraphy) present at that depth. While a surface or aerial alignment would disturb those strata closest to the surface, tunnel alignments would affect deeper strata. The largest paleontological impact and recovery opportunity would be at station sites, especially those near the La Brea Tar Pits (Figure S-45).

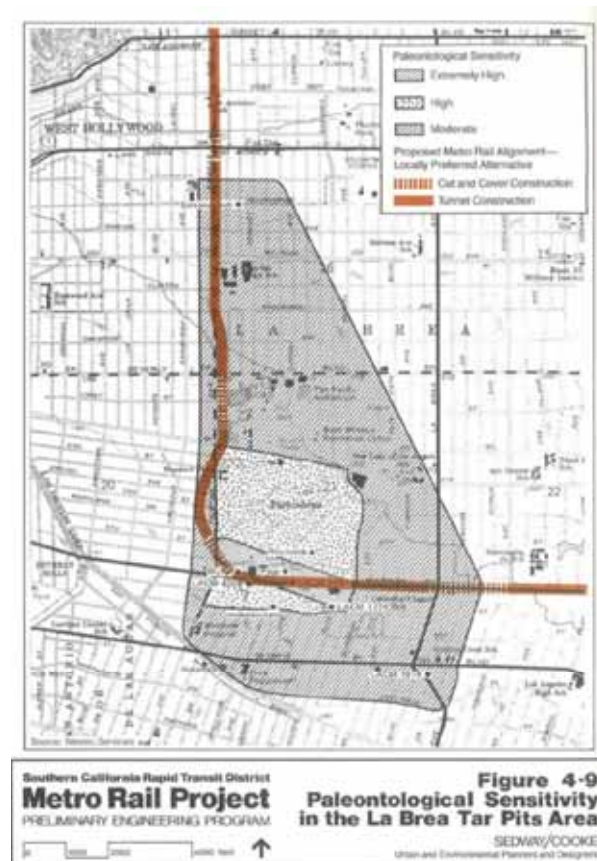


Figure S-45 La Brea Tar Pits Area

A previous study in 1983 identified the La Brea Tar Pits area as an important paleontological resource. The study also noted, however, that the route would pass through and disturb a variety of marine and nonmarine sedimentary deposits

ranging in age from Medial Miocene to Holocene. All stratigraphic units, except the Holocene alluvium (young Quaternary alluvium) and the intrusive basalts and andesites in the Topanga Formation, will have at least moderate potential for paleontological resources. The fossiliferous deposits appear to be confined to the uppermost 55 feet below the present surface and are found particularly within the uppermost 25 to 30 feet.

Since the La Brea Tar Pits area lies within the known Methane Risk Zone, there is an increased probability of encountering pockets of presently unknown resources. For other portions of the Methane Risk Zone area, the likelihood of encountering paleontological resources would not be significantly greater in tunneling in those portions of the gas zone when compared with tunneling in areas outside the gas zone. Overall, with an increased likelihood of encountering scientifically significant paleontological resources in this region, it is likely that mitigation measures would need to be implemented to recover and preserve such potentially encountered resources.

S.9.6 Archaeological Resources

Several previous studies identified three known archaeological sites within the Study Area site.

The most important of these is the Mid-Wilshire area site, which contains the La Brea Tar Pits in Hancock Park. Artifacts recovered indicate the La Brea Tar Pits may have been visited for hunting purposes and for acquiring pitch and tar rather than for settlement. The La Brea Tar Pits are a California State Historic Landmark (No. 170) and contain Pleistocene to Early Recent fossil deposits.

Based on the review of previous studies, it is unknown whether there are archaeological resources along much of the candidate alignments. However, since the La Brea Tar Pits site is located within the Methane Risk Zone, it is pos-

sible that other archaeological resources may be uncovered nearby because a larger area may have been visited by ancient people. If an archaeological resource is encountered in the Methane Risk Zone, it is not expected that the duration or cost of recovering such resources would be greater than that of recovering resources in other areas. Archaeological recovery efforts typically involve shallow excavation, which is not significantly affected by elevated gas levels.

S.10 Station Planning and Urban Design Concepts

An extensive urban design program was undertaken as part of this Alternatives Analysis. The effort involved a multi-step process that established a set of system-wide urban design principles, including a review of what plans and policies cities had in place that would be supportive of transit; development of an understanding of potential station areas in the corridor and how the existing Metro stations interface with surrounding communities; and development of station area typologies that could be applied to the station sites, including a “Kit of Parts” and an initial design and planning toolkit that communities could begin to use during the station area planning process.

The goals of the urban design program were as follows:

- Facilitate discussion about the vision and identity of the Westside Extension and how individual station areas could be designed to fit within this framework.
- Provide a forum for critical analysis of how the Alternatives Analysis should approach considerations of land use, design, and linkages between stations along the line and their urban neighborhoods.

- Propose design considerations for station areas so they will fit appropriately within the surrounding urban context (Figure S-46).
- Involve stakeholders and the Westside Extension planning team in a comprehensive station planning process (Figure S-47).
- Facilitate discussion about sensitive areas to assist in the station location decision-making process so that alternative station locations can be resolved.
- Help ensure that planning for the corridor considers and builds upon the needs, desires, and policies of the Westside cities.
- Assist in establishing guidelines and standards that may be helpful for future Metro transit corridor initiatives.



Figure S-46 Photo simulation showing possible integration of a historic structure with joint development

The program also is intended to help the Cities of Los Angeles, West Hollywood, Beverly Hills, and Santa Monica understand how station areas within their boundaries relate to other station areas along the corridor.



Figure S-47 Urban Design Workshop with City agencies on July 15, 2008

S.10.1 Urban Design Principles

As part of the urban design process, the following general principles were identified to inform station planning and design at all levels of planning and design:

Promote sustainable design:

- Develop pedestrian and bicycle connections and streetscape improvements to create pedestrian-friendly station areas and promote transit-oriented development (Figures S-48 and S-49).
- Preserve existing cultural and historic resources.
- Promote the use of recyclable materials and alternative energy systems.



Figure S-48 Promote Bicycle connection at Stations



Figure S-49 Station location should serve high pedestrian activity areas

Support local land use goals:

- Anticipate redevelopment and zoning revisions.
- Concentrate development around established activity centers (Figure S-50).
- Provide for future expansion and joint development at station sites.
- Conform to city growth plans and zoning regulations, including general plans and specific plans.



Figure S-50 Stations will connect to key destinations

Promote design excellence and enhance the urban environment:

- Involve urban designers, architects, and artists in the design of the system and its adjacencies.
- Develop innovative design solutions that are cost-effective and promote joint-development objectives.

Reflect a community's vision in station design and station area planning:

- Encourage new design concepts and use innovative materials and technologies.
- Promote design solutions that create environments accommodating to pedestrians and transit riders.

Promote safety, security, and defensible space:

- Promote a sense of community ownership of the station areas through high-quality design.
- Use Crime Prevention through Environmental Design principles in station and station area design.
- Ensure equal access to all transportation facilities and apply Universal Design principles to the design of these facilities.
- Eliminate pedestrian barriers and circulation conflicts at stations.

The stations and station areas along the Westside Extension should be united by an urban design vision that is:

- Linked to intermodal transit connections.
- Comfortable, safe, and inviting to pedestrians and bicyclists.
- "Imageable" to riders – they are memorable and navigable.
- Supportive of transit-oriented development and joint-development opportunities.
- Sensitive to the particular urban context in which they are located.

S-10.2 Existing City Plans and Policies

The Westside Extension team reviewed the plans and policies of the cities along the corridor. The documents from these cities are generally consistent with the Westside Extension proposed alignment alternatives and transit-oriented development expectations. The Cities of Los Angeles, Beverly Hills, and Santa Monica actively support an alignment along Wilshire Boulevard, and all cities include smart growth and/or transit-oriented principles and goals in their planning policies. West Hollywood recognizes Santa Monica Boulevard as the main spine of the city and the area with the highest density and concentration of retail and commercial uses, which makes it appropriate for a potential transit corridor.

S.10.3 Understanding Station Areas

The urban design study included a review and documentation of the Metro Red Line and Purple Line stations and station entrances to identify possible station design prototypes that could be applied to potential station areas for the Westside Extension. The existing Metro system is composed of a combination of standard components and variable design elements. The variable elements, such as signage, amenities, landscaping, special paving, art, and unique entrance designs and canopies, create a site-specific "customer environment" (Figure S-51) for the Metro rider. Designing station public spaces as customer



Figure S-51 Entrance canopy at Vermont/ Santa Monica station

environments makes the stations and station areas unique, imaginable, rider-friendly, and responsive to the needs of the communities that the system serves, which is key to the urban design vision for this corridor.

S.10.4 System-Wide Urban Design Principles

A set of system-wide urban design principles were developed. The general categories of principles developed relate to elements of the following:

- Connectivity (bus, bicycle, and pedestrian).
- Joint development and transit-oriented development.
- Parking.
- Placement and design of station ancillary structures.
- Wayfinding (Figure S-52).
- Station amenities.
- Landscaping.
- Lighting.
- Finishes and materials.
- Sustainability and creativity.
- Ensuring convenient, visible, and pleasant bus, bicycle, and pedestrian connectivity.
- Crafting development that is transit-oriented.
- Using sustainable, innovative, and place-specific design elements.



Figure S-52 Metro Signage

S.10.5 Station Area Typologies for the Corridor

The urban design concept is based on a set of station area typologies that can be used as a tool to help identify key urban design issues. Urban form along the corridor varies in scale and aesthetics, and developing station area typologies provides a tool to help make design recommendations that are consistent with the needs and desires of each community within the corridor.

Different typologies were developed to represent different station environments. Elements that make up the different typologies include density, scale, number of station entrances, station orientation, signage, public and station art, vendors, and special paving. Four different typologies were developed for the Westside Extension Corridor (Figure S-53).

S.10.6 Kit of Parts

After the station typologies were defined, a “kit of parts” was created that would allow each community to apply different “parts” or station elements that would best fit its stations and station areas.

The kit of parts included different types of station identities, including tourist destination (e.g., museum or pedestrian-oriented area); institutional destination (e.g., near a university or hospital); business center (near substantial employment areas); retail destination; or development potential. The parts of the kit included station orientation, signage, station and/or public art, street vendors and performers, and special paving.

Station-by-station typologies were developed using the potential station areas as a base and applying the station typologies and the kit of parts. These station-by-station typologies created visions of how the different stations along the Westside Extension Corridor could develop and how the communities

could mix and match station elements to create a unique station environment.

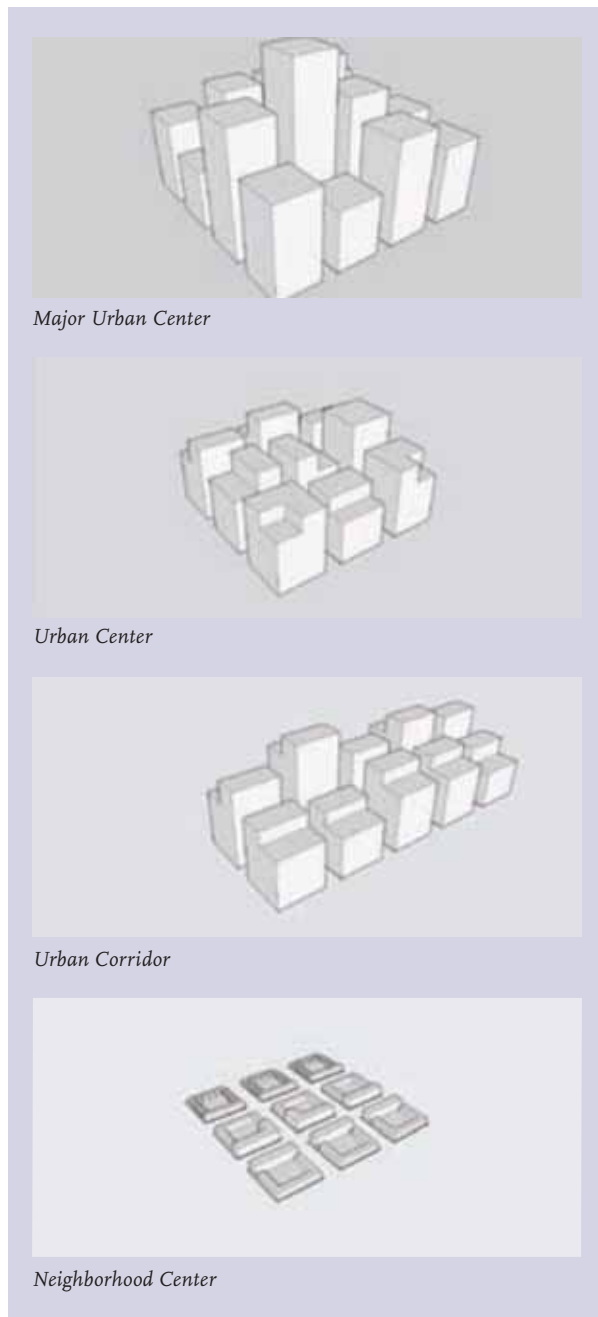


Figure S-53 Station Area Typologies

S.11 Public Involvement

The Metro Westside Extension study enjoyed considerable stakeholder interest and support over the approximately 14-month Alternatives

Analysis Study. The community outreach effort successfully raised awareness about the study, engaged stakeholders on an ongoing basis and, most importantly, garnered public input at key decision points that demonstrated widespread consensus about the study recommendations that require Board approval in order to move forward into the environmental process.



Public Meeting

Recognizing the size and diversity of the study area, Metro employed a thorough yet creative approach to ensuring an inclusive and transparent outreach effort. Elements of this outreach program included, although were not limited to, the following:

- Public meetings, including one series of early public and agency scoping meetings and three series of public update meetings (17 meetings in total) at key study milestones throughout the Study Area.
- Targeted stakeholder meetings to address specialized issues and localized concerns.
- Multi-lingual outreach to include Korean, Russian, Farsi, and Spanish-speaking stakeholders.
- Multi-tiered meeting notifications, including direct mail, print, broadcast and online media, advertisements, internet-based distribution via e-mail, and onboard Metro buses and trains.

- Employment of new media tools such as blogs, social networking sites, and other internet or web-based tools to involve a wider audience in the decision-making process.

Through the early scoping process, the project team learned that the overwhelming majority of stakeholders supported the need for transit improvement in the Westside Extension Transit Corridor study area, with a Wilshire Boulevard subway identified as the most favored route and mode. While the Santa Monica alignment also received noticeable support, many stakeholders suggested that Metro consider a project that would include both a Wilshire Boulevard and a Santa Monica Boulevard alignment. In many cases, where the public was in favor of both of these alignments, most thought that the Wilshire alternative should take precedence. Limited backing was voiced for aerial/monorail, light rail, and bus rapid transit modes.

After completion of the early scoping meetings, Metro conducted three subsequent series of community meetings and conducted presentations at a number of civic and community meetings to keep stakeholders informed of the project's progress and to receive input and feedback at each decision-making milestone. More than 1,400 people attended all four rounds of community meetings, and more than 900 comments were received in all forms.

At these subsequent public update meetings, the public indicated overwhelming support for transit improvements in the area. Metro consistently heard from stakeholders that their preferred mode of transit is a subway, with more than 90% of comments received favoring a Wilshire alignment. Support was also expressed for a subway on both the Wilshire and Santa Monica alignments, with most commenters requesting the Wilshire alignment be constructed before the

Santa Monica alignment, if phasing was necessary. Finally, in the last round of five meetings, the public expressed its support for identifying the two heavy rail alignments for further analysis through the DEIS/DEIR.

S.12 Results of the Detailed Evaluation

Table S-10 summarizes the results of the Detailed Evaluation described in Section S.7. The Detailed Evaluation consisted of evaluating the five most promising alternatives using the seven goals for the evaluation framework. These seven goals include Mobility Improvement, Transit-Supportive Land Use Policies and Conditions, Cost-Effectiveness, Project Feasibility, Equity, Environmental Considerations, and Public Acceptance.

In addition, the environmental evaluation focused on key objectives, including minimizing displacement of homes and businesses (equity), right-of-way impacts, impacts to character of the community (aesthetics/visual quality and noise/vibration), and impacts to sensitive and protected environmental resources (cultural and historic resources). The evaluation focused on describing major differences among the alternatives or demonstrating where the environmental effects were generally similar.

Table S-10 Summary Matrix (continued on next page)

Performance Measures				Alternatives							
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT	
							17	1	14	11	16
▶ GOAL A: MOBILITY IMPROVEMENT											
Peak Period Travel Times (minutes) between Major Origin—Destination Pairs											
A	1	a	Transit Peak Period Travel Time (AM Peak) (minutes)—Between Del Mar Station (Gold Line) and:								
			Century City	80	92	92	80	48		48	
			Santa Monica/San Vicente (WeHo)	72	83	83	64	60		50	
			Wilshire/Beverly (BH)	78	90	90	65	46		46	
			Wilshire/Westwood	82	94	94	75	50		50	
			4th/Wilshire (Santa Monica)	112	129	129	91	57		57	
			Transit Peak Period Travel Time (AM Peak) (minutes)—Between Pershing Square Station (Red Line) and:								
			Century City	48	55	55	47	20		20	
			Santa Monica/San Vicente (WeHo)	49	56	56	37	35		23	
			Wilshire/Beverly (BH)	42	48	48	35	18		18	
			Wilshire/Westwood	54	62	62	45	23		23	
			4th/Wilshire (Santa Monica)	70	81	81	65	29		29	
			Transit Peak Period Travel Time (AM Peak) (minutes)—Between Florence Station (Blue Line) and:								
			Century City	60	69	69	74	41		41	
			Santa Monica/San Vicente (WeHo)	69	79	79	57	53		43	
			Wilshire/Beverly (BH)	64	74	74	56	39		39	
			Wilshire/Westwood	76	87	87	66	44		44	
			4th/Wilshire (Santa Monica)	99	114	114	86	50		50	
			Transit Peak Period Travel Time (AM Peak) (minutes)—Between Reseda Station (Orange Line) and:								
			Century City	72	83	83	66	66		45-52	
			Santa Monica/San Vicente (WeHo)	83	95	95	57	77		41-48	
			Wilshire/Beverly (BH)	80	92	92	71	64		58-65	
			Wilshire/Westwood	59	68	68	71	68		47-54	
			4th/Wilshire (Santa Monica)	97	112	112	86	75		54-61	
			Transit Peak Period Travel Time (AM Peak) (minutes)—Between Covina Station (Metrolink) and:								
			Century City	94	108	108	92	67		67	
			Santa Monica/San Vicente (WeHo)	99	114	114	87	79		69	
			Wilshire/Beverly (BH)	98	113	113	82	65		65	
			Wilshire/Westwood	99	114	114	93	69		69	
			4th/Wilshire (Santa Monica)	119	137	137	108	76		76	
			Transit Peak Period Travel Time (AM Peak) (minutes)—Between Wilshire/Western Station (Purple Line) and:								
			Century City	35	40	40	34	10		10	
			Santa Monica/San Vicente (WeHo)	30	35	35	30	22		22	

Table S-10 Summary Matrix (continued from previous page)

Performance Measures				Alternatives									
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT			
							17	1	14	11	16		
A	1	a	Wilshire/Beverly (BH)	20	26	26	19	8		8			
			Wilshire/Westwood	36	41	41	31	13		13			
			4th/Wilshire (Santa Monica)	51	59	59	47	19		19			
			Transit Peak Period Travel Time (AM Peak) (minutes)—Between North Hollywood Station (Red Line) and:										
			Century City	58	67	67	35	39		14-21			
			Santa Monica/San Vicente (WeHo)	51	59	59	26	51		10-18			
			Wilshire/Beverly (BH)	49	56	56	45	37		27-35			
			Wilshire/Westwood	61	70	70	43	42		16-23			
			4th/Wilshire (Santa Monica)	77	89	89	55	48		23-30			
			Average End-to-End Transit Operating Speeds (mph)										
A	1	b	Avg end to end transit operating speed in mph (Between Union Station/Downtown and 4th/Wilshire, SM)	14	12	12	16	32	30	32	30		
Note: Some alternatives (11, 16) require transfer(s) to travel between Union Station and Santa Monica													
Percentage of Transit Alignment Operating in Mixed Flow Traffic													
A	2	a	% of transit alignment operating in mixed flow traffic by operation type	n/a	100	100	100	0	0	0	0		
Note: Removes 2 lanes of traffic													
Number of Transfers between Select Origin—Destination Pairs													
A	2	b	Transfers Required (AM Peak)—Between Del Mar Station (Gold Line) and :										
				Century City	1	1	1	1	1		1		
				Santa Monica/San Vicente (WeHo)	1	1	1	2	2		1		
				Wilshire/Beverly (BH)	1	1	1	2	1		1		
				Wilshire/Westwood	1	1	1	2	1		1		
				4th/Wilshire (Santa Monica)	1	1	1	2	1		1		
Transfers Required (AM Peak)—Between Pershing Square Station (Red Line) and :													
				Century City	0	0	0	1	0		0		
				Santa Monica/San Vicente (WeHo)	0	0	0	1	1		0		
				Wilshire/Beverly (BH)	0	0	0	0	0		0		
				Wilshire/Westwood	0	0	0	0	0		0		
				4th/Wilshire (Santa Monica)	0	0	0	0	0		0		
Transfers Required (AM Peak)—Between Florence Station (Blue Line) and :													
				Century City	1	1	1	2	1		1		
				Santa Monica/San Vicente (WeHo)	1	1	1	2	2		1		
				Wilshire/Beverly (BH)	1	1	1	1	1		1		

Table S-10 Summary Matrix (continued from previous page)

Performance Measures			Alternatives										
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT			
							17	1	14	11	16		
A	2	b	Wilshire/Westwood	1	1	1	1	1	1	1			
			4th/Wilshire (Santa Monica)	1	1	1	1	1	1				
			Transfers Required (AM Peak)—Between Reseda Station (Orange Line) and:										
			Century City	1	1	1	2	2	1-2				
			Santa Monica/San Vicente (WeHo)	2	2	2	2	3	1-2				
			Wilshire/Beverly (BH)	2	2	2	3	2	2				
			Wilshire/Westwood	1	1	1	2	2	1-2				
			4th/Wilshire (Santa Monica)	2	2	2	2	2	1-2				
			Transfers Required (AM Peak)—Between Covina Station (Metrolink) and:										
			Century City	1	1	1	2	1	1				
			Santa Monica/San Vicente (WeHo)	1	1	1	2	2	1				
			Wilshire/Beverly (BH)	2	2	1	2	1	1				
			Wilshire/Westwood	2	2	2	2	1	1				
			4th/Wilshire (Santa Monica)	2	2	2	2	1	1				
			Transfers Required (AM Peak)—Between Wilshire/Western Station (Purple Line) and:										
			Century City	1	1	1	1	0	0				
			Santa Monica/San Vicente (WeHo)	1	1	1	1	1	1				
			Wilshire/Beverly (BH)	0	0	0	0	0	0				
			Wilshire/Westwood	0	0	0	0	0	1				
			4th/Wilshire (Santa Monica)	0	0	0	0	0	1				
Transfers Required (AM Peak)—Between North Hollywood Station (Red Line) and:													
Century City	1	1	1	1	1	0-1							
Santa Monica/San Vicente (WeHo)	1	1	1	1	2	0-1							
Wilshire/Beverly (BH)	1	1	1	2	1	0-1							
Wilshire/Westwood	1	1	1	1	1	0-1							
4th/Wilshire (Santa Monica)	1	1	1	1	1	0-1							
Provide Sufficient Transit Capacity													
A	3	a	Estimated maximum capacity (in thousands) of new EW transit service (Passengers per hour) (Assuming 18 trains per hour or 30 buses per hour)	n/a	3	3	3	18	18	18	18		
A	3	b	Potential for capacity expansion beyond 2030	L	L	L	Md	H	H	H	H		
Note: L = Low; M = Medium; Md = Moderate; H = High													

Table S-10 Summary Matrix (continued from previous page)

Performance Measures				Alternatives							
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT	
							17	1	14	11	16
Transit Ridership											
A	3	b	Daily New Transit Trips (Change from No Build) in thousands		n/a	1.9	13.8	39.3	37.0	47.8	44.9
			Change in Urban Rail Boardings (Change from No Build) in thousands		n/a	-0.8	13.3	95.5	88.3	117.0	109.0
			“New Stations” Urban Rail Boardings in thousands		0	0	0	61.5	59.9	80.0	77.1
Population and Population Density within ½ Mile of the Alignment											
A	4	a	Population/Pop density within ½ mile of each alignment (in thousands)								
			2030 Population within ½ mile of Alignment		n/a	n/a	336	216	225	303	302
			2005/6 Average Population Density per Square Mile within ½ mile of Alignment		n/a	n/a	12.5	16.5	16.2	16.1	16.3
			2030 Average Population Density per Square Mile within ½ mile of Alignment		n/a	n/a	13.8	18.3	17.9	17.7	17.7
Employment and Employment Density within ½ Mile of the Alignment											
A	4	b	Employment/Employment Density within ½ mile of Each Alignment (in thousands)								
			2005/6 Employment within ½ mile of Alignment		n/a	n/a	332	221	235	293	293
			2030 Employment within ½ mile of Alignment		n/a	n/a	387	258	274	342	334
			2005/6 Average Employment Density per Square Mile within ½ mile of Alignment		n/a	n/a	13.6	18.7	18.7	17.1	17.2
			2030 Average Employment Density per Square Mile within ½ mile of Alignment		n/a	n/a	15.9	21.9	21.8	20.0	19.7
Note: Removes 2 lanes of traffic											
Transit Dependent Populations											
A	4	c	Number of low income HH within ½ mile of each alignment present (in thousands)		39.8	39.8	39.8	18.7	18.6	25.9	26.0

Table S-10 Summary Matrix (continued from previous page)

Performance Measures				Alternatives							
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT	
							17	1	14	11	16
Competitive Speeds											
A	4	d	Ability for transit to be competitive with the auto in speed for key OD pairs		C	C	C	S	S	T	T
Note: C = Comparable Speed to Auto, Transfers Req.; S = Much Higher Speed than Auto, No Transfer; T = Much Higher Speed than Auto, Transfers Req.											
Enhancing Linkages and Major Trip Attractors/Generators Within the Corridor											
A	5	a	Ability of alts to continue a one seat ride		L	L	M	H	H	M	H
A	5	b	Number of direct connections within 1/8 mile walk to other lines, NS bus routes, etc		12	12	12	7	8	10	11
A	5	c	Number of transfers required to access regional rail - Metrolink, Amtrak		2	2	2	1	1	1	1
A	5	d	Number of direct connections to key activity centers within 1/8 mile walk		10	10	10	7	9	10	12
Note: L = Low; M = Medium; Md = Moderate; H = High											
▶ GOAL B: TRANSIT SUPPORTIVE LAND USE POLICIES AND CONDITIONS											
Number of High Density Mixed Use Activity Centers Within ½ Mile of Each Alignment											
B	1	a	Number of high density mixed use activity centers within ½ mile of each alignment		17	17	17	9	12	14	17
Note: Mixed Use Activity Centers are feature a mixture of land uses such as residential and commercial, and typically provide retail uses that encourage pedestrian travel.											
Number of High Opportunity Areas for Redevelopment Within ½ Mile of Each Alignment											
B	2	a	Number of high opportunity areas for redevelopment within ½ mile of each alignment		n/a	n/a	n/a	W	W	W H	W H
Note: All Cities within Study Area maintain specific TOD provisions or are receptive to TOD provisions as defined in their general plans, community plans or specific plans W=City of Los Angeles CRA Redevelopment Area in Wilshire Center/Koreatown; H=City of Los Angeles CRA Redevelopment Area in Hollywood											
▶ GOAL C: COST-EFFECTIVENESS											
Cost-Effectiveness											
C	1	a	Order of Magnitude Capital Cost (\$ Billions, 2008)		\$0.00	\$0.134	\$1.082	\$6.063	\$6.997	\$9.057	\$9.448
			Order of Magnitude Capital Cost (10 years) (\$ Billions, YOE)		\$0.00	\$0.172	\$1.387	\$7.771	\$8.968	\$11.610	\$12.111

Table S-10 Summary Matrix (continued from previous page)

Performance Measures				Alternatives							
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT	
							17	1	14	11	16
C	1	b	Capital Cost Per Route Mile (\$ Millions, 2008)		\$0	n/a	\$34	\$475	\$489	\$509	\$507
			Capital Cost Per Route Mile (\$ Millions, YOY)		\$0	n/a	\$44	\$609	\$627	\$652	\$650
C	1	c	Order of Magnitude Annual O&M Cost (\$ Millions, 2008)		\$1,363	\$1,378	\$1,369	\$1,459	\$1,473	\$1,518	\$1,530
C	1	d	Daily Hours of Transit User Benefit compared to No Build		n/a	1,700	13,800	48,200	45,300	57,800	54,000
			Cost per hour of transit system user benefits for selected representative alternatives compared to No Build (CEI)		n/a	\$53	\$17	\$35	\$44	\$44	\$51

Note: Removes 2 lanes of traffic

▶ GOAL D: PROJECT FEASIBILITY

Financial Feasibility

D	1	a	Relative eligibility of alts for new starts funding*		L	L	H	M	M	M	L
D	1	b	Consistency with Metro's LRTP and financial direction**		C	C	C	N	N	N	N

Note: * L = Low; M = Medium; H = High; VH = Very High

** C = Consistent; N = No

If traffic lanes must be replaced, then increase to Medium.

▶ GOAL E: EQUITY

Equity

E	1	a	Number of low income HH within ½ mile of each alignment present (in thousands)		39.8	39.8	39.8	18.7	18.6	25.9	26.0			
E	2	a	Local jurisdiction/communities directly impacted - displacements, construction		City of SM	City of SM	City of SM	City of SM	City of SM	City of SM	City of SM			
					City of BH	City of BH	City of BH	City of BH	City of BH	City of BH	City of BH			
					City of WH	City of WH	City of WH	City of LA (7)	City of LA (8)	City of WH	City of WH			
					City of LA (8)	City of LA (8)	City of LA (8)	LAC	LAC	City of LA (8)	City of LA (9)			
					LAC	LAC	LAC			LAC	LAC			
					Total jurisdictions/ communities			12	12	12	10	11	12	13

Table S-10 Summary Matrix (continued from previous page)

Performance Measures				Alternatives							
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT	
							17	1	14	11	16
E	2	b	Number of residents within ½ mile by ethnic group/minority populations								
			Black		15,123	15,123	15,123	9,836	9,781	11,390	11,279
			Amer Indian/Eskimo		1,030	1,030	1,030	521	554	720	694
			Asian		47,951	47,951	47,951	35,528	35,358	38,356	38,620
			Hawaiian/Pacific Islander		354	354	354	208	210	249	241
			Other-Non-Hispanic		1,201	1,201	1,201	750	690	862	807
			2+Races Non-Hispanic		13,180	13,180	13,180	7,977	7,713	9,679	9,450
			Hispanic		47,041	47,041	47,041	21,837	22,012	27,021	27,048

Note: Removes two lanes of traffic

City of SM = City of Santa Monica; City of BH = City of Beverly Hills; City of WH = City of West Hollywood; City of LA = City of Los Angeles; LAC = Los Angeles County

▶ GOAL F: ENVIRONMENTAL CONSIDERATIONS

Estimated ROW Impact

F	1	a	Estimated ROW impact based on proposed alt footprint (thousands of square feet)	None	Mn	1,335	420	480	550	570
---	---	---	---	------	----	-------	-----	-----	-----	-----

Note: Mn = Minimal

Impacts to Traffic Circulation in Lane Miles

F	2	a	Lane miles of traffic lanes removed or impacted	0	0	44.8	0	0	0	0
F	2	b	Lane miles of parking lanes removed or impacted	0	0	26.4	0	0	0	0

Note: Removes two lanes of traffic

Estimated Visual and Noise Impacts

F	3	a	Estimated level of visual impacts to surrounding neighborhoods	None	None	L	Md	Md	Md	Md
F	3	b	Potential noise & vibration impact - Operational Impacts	0	0	0	0	0	0	0

Note: L = Low; Mn = Minimal, Md = Moderate; H = High, VH = Very High

Total amount of acreage, 2 hospitals and 5 schools

Emergency Exits and Evacuation

F	4	a	Ability to provide for emergency exits and evacuation	n/a	n/a	n/a	Md	Md	Md	Md
---	---	---	---	-----	-----	-----	----	----	----	----

L = Low; Mn = Minimal; Md = Moderate; H = High; VH = Very High

Table S-10 Summary Matrix (continued from previous page)

Performance Measures				Alternatives							
Goal	Objective	Measure	Criteria	Today	No Build	TSM	BRT	Wilshire HRT		Combined HRT	
							17	1	14	11	16
Vehicle/Transit/Pedestrian Conflicts											
F	4	b	Extent of vehicle/transit/pedestrian conflicts that are not fully protected		Md	Md	L-M	L	L	L	L
Note: Removes two lanes of traffic L = Low; Mn = Minimal; Md = Moderate; H = High; VH = Very High											
Impacts on Sensitive and Protected Environmental Resources											
F	5	a	Estimated Number of Cultural or Natural Resources Directly Impacted		n/a	n/a	65	45	36	78	65
			City of LA Historic Cultural Monument (HCM)		n/a	n/a	22	11	6	30	22
			City of LA Historic Period Overlay Zone (HPOZ)		n/a	n/a	3	3	2	4	3
			California Historic Landmark (CaHL)		n/a	n/a	3	2	2	3	3
			National Register of Historic Places (NRHP)		n/a	n/a	5	2	1	7	5
			Archeological Resource (AR)		n/a	n/a	22	18	18	22	22
Note: Removes two lanes of traffic											
2030 Estimated Reduction in VMT											
F	6	a	Estimated Daily 2030 Daily Reduction in VMT (Study Area) Compared to No Build (in thousands)		n/a	6	23	61	55	73	71
Note: Removes two lanes of traffic											

S.13 Recommendations

As stated at the beginning of this Executive Summary, this comparative analysis recommended that the following alternatives be considered for future study in a Draft EIS/EIR process as the best alternatives that meet the Purpose and Need for the Westside Extension Transit Corridor Study and as the most competitive for possible Federal New Starts funding:

- No Build (required).
- Transportation System Management (required).
- HRT Alternative 1.
- Combined HRT Alternative 11.

Figures S-54, S-55, and S-56 present information on how Alternatives 1 (Wilshire) and 11 (Combined) performed on ridership forecasts, transit user benefits, and capital costs, respectively. Due to a greater number of stations, Alternative 11 had a higher ridership forecast than Alternative 1 by more than 20,000 daily boardings. Additionally, Alternative 11 would provide an additional 10,000 hours per day of user benefits over Alternative 1. However, due to its longer length, the capital costs of Alternative 11 exceeded the costs of Alternative 1 by nearly \$3 billion.

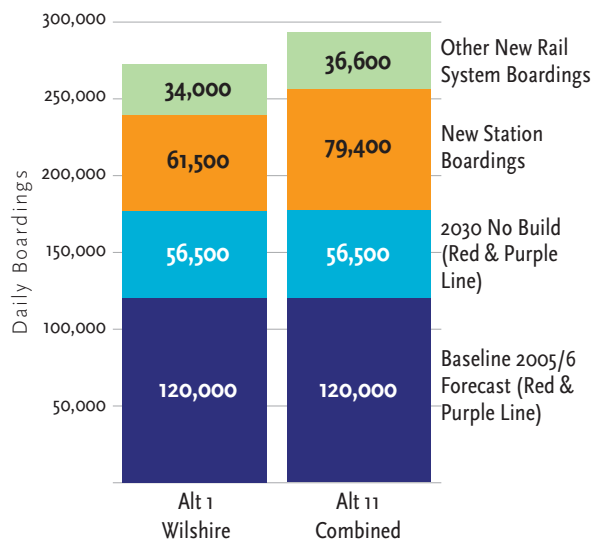


Figure S-54 Ridership Forecasts

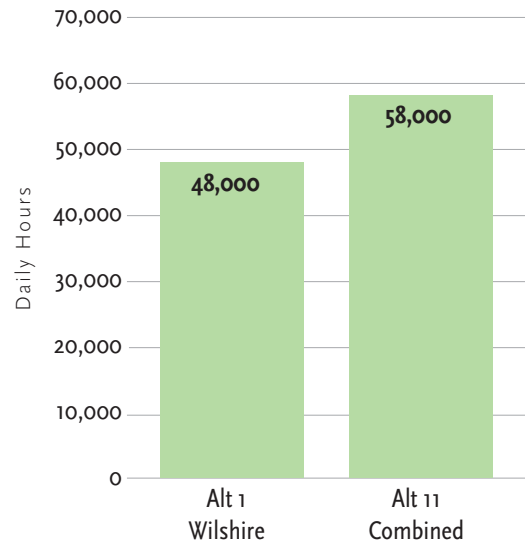


Figure S-55 Transit User Benefits (Daily Hours)

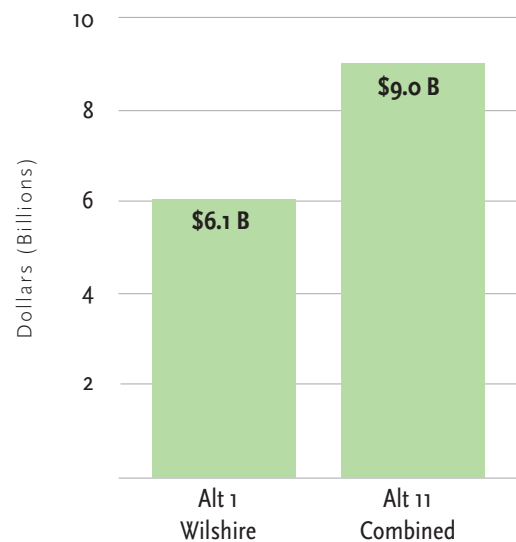


Figure S-56 Capital Costs

Both of these alternatives are recommended for further review and analysis in subsequent planning and environmental studies.

This page left intentionally blank