



2.0 ALTERNATIVES CONSIDERED FOR EARLY SCOPING

2.1 Planning Context

This section presents the planning context for the conceptual definition of the No-Build, Transportation Systems Management (TSM), and Build alternatives developed for early scoping review and comment. In accordance with Federal Transit Administration (FTA) New Starts procedures, the Build alternatives were evaluated against the No-Build alternative which includes all committed transportation improvements programmed through 2030. The Build alternatives were also compared against a TSM alternative, which includes low cost improvements to the committed system to improve conditions in the study area and still address the study purpose and need.

The study and development of major transit investments in the Westside Corridor have a considerable history. That study history was summarized previously in Section 1.2 and served as a basis for the alternatives suggested for public scoping review. The alternatives represent a range of capital investment choices for addressing the future travel needs of transit users in the Study Area. The alternatives were developed based on a review of transit technologies and alignment locations from previous studies, current knowledge of the identified transit markets, community input and suggestions, and the study purpose and need. This chapter includes a brief overview of the scoping process, as well as a discussion of the comments received during scoping on transit technologies, alignments and station locations. These comments along with additional technical information gained from previous studies and the mobility needs analysis form the basis for the alternatives developed for advancement to the alternatives screening step. These resulting alternatives are described in more detail in Section 2.11. During the alternative screening step, the 17 alternatives were screened down to five alternatives by answering key questions/concerns that differentiated the choices from one another. These five alternatives are described in Section 2.11 and are the focus of the remainder of the report.

2.2 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), and Bus Rapid Transit or BRT (Metro Orange Line). As such, these transit modes were presented at Early Scoping meetings as representing a range of fixed guideway transit modes that could be considered for the Westside Extension Alternatives Analysis 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 Rapid Bus under the No-Build and TSM Alternatives.

2.2.1 Heavy Rail Transit

HRT systems are at the upper end of the urban transit spectrum in terms of speed, capacity and service predictability. Also referred to as rapid rail, metro or subway, HRT operates in an exclusive grade separated right-of-way. Power is collected from a third rail located adjacent to and parallel with the running rail. No crossings of the right-of-way are permitted in the same plane with HRT operations.

In Los Angeles currently, HRT is characterized by:

- very high passenger carrying capacity, up to 800 passengers per 6-car train
- maximum speed of 70 miles per hour (mph)
- capable of operations on gradients up to 4 percent
- can traverse an absolute minimum 750-foot horizontal radius curve up to a design minimum of 1,400 feet
- operates in multiple unit trains with up to six cars per train
- stations are up to 450 feet in length
- best suited for service in long high density corridors to connect the central city with major activity centers and dense residential communities
- local examples of this technology are the Metro Red and Purple Lines

Figure 2-1. Example Heavy Rail Vehicle in Subway



2.2.2 Light Rail Transit

LRT is a flexible rail transportation mode which can operate in a variety of physical settings. LRT uses dual rails for both support and guidance. As the modern technology descendent of the trolley or streetcar, a distinctive feature of LRT is that vehicles draw power from an overhead contact system. This is in contrast to heavy rail vehicles that usually are powered from a track level third rail. This overhead power collection feature allows LRT systems to be integrated with other at-grade transportation modes. With overhead power collection and the availability of articulated vehicles operating up to three car 'trains,' LRT can operate in mixed traffic on tracks embedded in the street, on its own at-grade right of way with street and pedestrian crossings, or on a fully separated right-of-way, at grade, elevated, or underground.

In Los Angeles currently, LRT is characterized by:

- exclusive track in previous traffic lane operations or separate right-of-way
- high floor vehicles and station platforms
- center of street at-grade running unless grade separations are justified
- preservation of the number of existing traffic and parking lanes
- speeds up to 55 mph
- up to 425 passengers per 3-car train

Figure 2-2. Example Light Rail Vehicles

- an average of one mile station spacing
- stations are approximately 270 ft long
- local examples of this technology are the Metro Blue, Green, and Gold Lines

2.2.3 Bus Rapid Transit

BRT is a bus based “rapid” transit system typically utilizing highly flexible service and advanced technologies to improve customer convenience and reduce delays compared to more traditional bus operations. The goal of BRT is to combine some of the qualities of light rail with the flexibility and lower cost of buses.

Key attributes for this mode alternative in the Westside Extension Transit Corridor Study Area include:

- exclusive bus lane operations during peak periods
- BRT lanes:
 - ▶ provide through use of existing parking lanes with parking restrictions during peak periods
 - ▶ shared with right turn traffic
 - ▶ no major street widening for BRT lanes
- low floor compressed natural gas (CNG) vehicles with loading from all doors
- off vehicle fare collection
- articulated buses up to 65 feet long
- capacity of up to 100 passengers
- travel speeds up to prevailing traffic speeds, with some enhanced speed capacity when operated during peak periods in dedicated lanes
- average station spacing at one mile apart

Figure 2-3. Example Bus Rapid Transit Vehicles

The Metro Orange Line is an example of this technology utilizing an exclusive guideway. Metro currently does not operate exclusive bus lanes in an arterial street right-of-way, such as would be required in the Westside Extension Transit Corridor to achieve effective travel speeds.

2.2.4 Metro Rapid

Metro Rapid is a high level express bus operation in mixed flow traffic but with fewer stops than standard local bus service. Speeds are a function of street traffic conditions. Metro can operate rapid bus service with 'priority' along most segments of Wilshire Boulevard. For Metro applications, the vehicles are fueled by CNG and are articulated vehicles 60 feet in length with a capacity of 84 passengers. Station spacing is approximately $\frac{3}{4}$ of a mile and station length varies based on physical opportunities along the corridor. Examples of this technology are Metro Rapid Bus Lines 720 and 704 operating on Wilshire and Santa Monica Boulevards, respectively.

For purposes of the Westside Extension Alternatives Analysis Study, Metro Rapid technology would not qualify as an eligible mode for New Starts fixed guideway grant funding because it operates in mixed-flow traffic and would not utilize a dedicated lane. Metro Rapid service currently exists along many routes in the Westside and is included in the No Build and TSM Alternatives.

Figure 2-4. Example Rapid Bus Vehicles

2.3 Alignment Alternatives Presented at Early Scoping

Three primary build alternatives were identified for consideration during the public scoping meetings based on all the previous planning activity in the Westside Extension Corridor study area. These alignments are depicted in Figure 2-5 and included a Wilshire Boulevard alignment, a Santa Monica Boulevard alignment and a combined Wilshire/Santa Monica Boulevards alignment. These three corridor alignments represented street rights-of-way that could reasonably be used in a subway, at-grade or elevated configuration and that could connect existing transit service to new activity centers with demonstrated strong transit usage. As shown in Figure 2-5, 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 Santa Monica Boulevard.

2.3.1 Wilshire Boulevard Alignment

The Wilshire Boulevard alignment begins at the current Metro Purple Line terminus at Wilshire/Western in Wilshire Center and continues west along Wilshire Boulevard through Mid-Wilshire and Beverly Hills to Santa Monica Boulevard. At Santa Monica Boulevard, the alignment turns southwest to serve Century City, before returning to Wilshire Boulevard to serve Westwood, West Los Angeles, and finally Santa Monica, terminating near 4th Street. The entire Wilshire route is approximately 12.5 miles in length and, as shown at the scoping meetings, has 13 stations.

2.3.2 Santa Monica Boulevard Alignment

The Santa Monica Boulevard alignment begins at the current Metro Red Line Hollywood/Highland Station in Hollywood and generally continues in a southwesterly direction serving West Hollywood, Beverly Hills, and Century City along Santa Monica Boulevard. This alignment returns to Wilshire Boulevard to serve Westwood, West Los Angeles, and finally Santa Monica, terminating near 4th Street. The entire Santa Monica Boulevard alignment is approximately 12.2 miles in length and as shown has 12 stations.

2.3.3 Wilshire/Santa Monica Combined

The Wilshire/Santa Monica Combined corridor concept reflects that transit usage may be strong enough to serve both the Wilshire and Santa Monica Boulevards alignments. The combined concept as shown has 17 stations over a combined segment length of approximately 19 miles. Operationally, the service levels would be comparable on all segments.

2.4 Suggested Refinements from Early Scoping

Based on an extensive set of scoping comments received, a variety of alternative modes and alignments were suggested for consideration in addition to those presented at the public scoping meetings. The comments received during scoping, including verbal, written and electronic are available in detail in the *Final Project Scoping Report (November 9, 2007)*. Comments directly relevant to the team's decision to add or refine the mode/alignment alternatives are presented below.

Figure 2-5. Possible Alignment Alternatives Presented at Early Scoping



WESTSIDE EXTENSION TRANSIT CORRIDOR STUDY

2.4.1 Technologies (Modes) Suggested

The comments provided by the speakers, from the written comments of attendees, email comments, and letter comments at the early scoping meetings and during the official comment period strongly supported the subway (HRT) mode (a total of 262 comments). Several commenters expressed favor for a potential elevated monorail alternative (a total of 22 comments). Several other commenters expressed support for light rail transit (a total of 18 comments). Other commenters expressed a preference for additional bus rapid transit service (a total of 14 comments).

Based on these comments, aerial monorail transit technology was added to the evaluation. A description of this technology is in Section 2.8.4. All other modes presented by Metro at the scoping meetings remained for screening.

2.4.2 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 Project (52 comments). Almost an equal number were in support of both alignments (Wilshire and Santa Monica).

A number of speakers suggested route alignment deviations from either Wilshire or Santa Monica Boulevards to serve major activity centers not located directly on those routes. These included route deviations to serve Farmers Market/The Grove, Cedars-Sinai/Beverly Center, the Sunset Strip, University of California Los Angeles (UCLA) 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 Third 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 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 which are further described in Section 2.8. 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.

2.4.3 Stations Suggested

People who spoke at the Early Scoping Meetings generally supported the potential station locations that were presented and are shown on Figure 2-5. However, some attendees suggested some additional stations as well. Some speakers suggested that a station in the vicinity of 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 at Bundy Drive and on Wilshire Boulevard between 17th and 20th Streets near the UCLA/Santa Monica Hospital. Concern was also expressed by several speakers regarding a station on Wilshire Boulevard at Crenshaw Boulevard or elsewhere in the Park Mile Specific Plan segment 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.

2.5 Relationship to Purpose and Need

The purpose of the Westside Extension Transit Corridor Project is to improve public transit service and mobility in the Westside Corridor between Mid-Wilshire and Santa Monica. The overall goal of the proposed project is to improve mobility in the Westside Corridor by connecting with or extending existing lines, such as the Metro Red Line or the Metro Purple Line. The alternatives developed and presented in Section 2.8 were subject to analysis screening based on goals and objectives which relate to the defined purpose and need for the project. All alternatives proposed for screening addressed the study purpose and need. Subsequent screening and detailed analysis of the alternatives described in later sections of this document will show how well the alternatives met the goals stated in the purpose and need.

2.6 Early Scoping Process

The Early Scoping process followed for the Westside Transit Extension Corridor study included both early identification of prospective participants and early notification for all meetings. The intention was to both inform and solicit feedback on what transit improvements should be studied and how transit improvements should be evaluated. The official notification process began with an early scoping notice published in Federal Register Volume 72 No. 189 on Monday October 1, 2007. The official scoping comment period was initially scheduled to extend until November 1, 2007, but was extended until November 7, 2007, at the request of several stakeholders. The general public and agency representatives were given opportunities to attend public meetings and provide verbal plus written comments. In addition, those wishing to provide comments could view project information on Metro's website and respond in writing or by email. All means of public notification, meeting schedules, and feedback that were made available are included in *Final Project Scoping Report (November 9, 2007)*. Section 8.0 includes the substantive comments received.

This section summarizes the activities completed to make the community aware and provide opportunities for participation in the early scoping for the Westside Transit Extension Corridor Alternatives Analysis. These notification and outreach activities included:

- Publishing the Early Scoping notice in the *Federal Register*
 - ▶ Federal Register Volume 72 No. 189 on Monday October 1, 2007
- Conducting Early Scoping meetings with agencies and jurisdictions
 - ▶ Meeting with Metro Board Deputies – August 30, 2007
 - ▶ Meeting with Metro Chief Planning Officer and Westside Consultants' team – September 4, 2007



- ▶ Meeting with City of Los Angeles Mayor’s office to brief representatives – September 6, 2007
- ▶ Meeting with elected officials at West Hollywood City Hall – September 10, 2007
- Identifying public scoping meeting stakeholders
 - ▶ Elected officials on the local, state and federal level
 - ▶ Neighborhood Councils and other elected groups
 - ▶ Homeowners Associations and Neighborhood Organizations
 - ▶ Chambers of Commerce and business leaders
 - ▶ Community based and civic organizations
 - ▶ Key destinations and employers
 - ▶ Transportation advocates and interest groups
 - ▶ Print and broadcast Media, including community-based publications and blogs
 - ▶ Memberships of these groups (via proprietary mailing lists)
 - ▶ Other interested groups and persons
- Preparing and distributing public notices of meetings
 - ▶ Email notices
 - ▶ US mail
 - ▶ Online at www.metro.net/westside
 - ▶ Posters
- Performing media and blog outreach
 - ▶ 83 media outlets
 - ▶ Press releases
 - ▶ Advertisements
 - ▶ Inclusion in community calendars
 - ▶ 34 key website blogs
- Conducting follow-up with community groups and agencies
 - ▶ Multiple organizations (such as transportation advocacy groups, neighborhood and business organizations, civic groups, and academic institutions) were contacted requesting that they forward invitations to the Scoping Meetings to their memberships or constituents.
 - ▶ Follow-up calls were also made to agencies inviting them to attend the Agency Scoping Meeting. Calls were made to approximately 70 agencies between October 5 and 10, 2007.



- Hosting Agency scoping meetings
 - ▶ Thursday, October 10, 2007 from 3:00 - 4:30 p.m. at the Los Angeles County Sheriff's Substation Briefing Room in West Hollywood
 - ▶ Attended by 18 representatives from nine jurisdictions
- Hosting public scoping meetings
 - ▶ Five Early Scoping Meetings were held in October 2007
 - ▶ Format included an open house, a presentation, and a public comment period
 - ▶ Meetings were held in Century City/Westwood (77 attendees), West Hollywood (58 attendees), Mid-Wilshire (73 attendees), Beverly Hills (69 attendees), and Santa Monica (81 attendees)
- Hosting other community meetings
 - ▶ A supplemental community meeting was held in West Hollywood in October 2007 (111 attendees)
 - ▶ Metro also attended meetings as a part of the regular course of business or by request:
 - ▶ Beverly Hills and Greater Los Angeles Association of Realtors
 - ▶ Century City Chamber of Commerce
 - ▶ Hollywood Chamber of Commerce Legislative Committee
 - ▶ Metro Westside/Central Governance Council
 - ▶ Outpost Estates Homeowners Association
 - ▶ Southern California Transit Advocates
 - ▶ Traffic Committee, West Los Angeles Community Police Advisory Board
 - ▶ Westside Cities Council of Governments (COG) and COG Transportation Committee
 - ▶ Westside Transportation Partners

2.6.1 Summary of Scoping Comments

The public comment period for the Westside Extension Transit Corridor Study commenced October 1, 2007 with the publication of the Early Scoping Notice and closed on November 1, 2007. At the request of several stakeholders, the comment period was extended until November 7, 2007. As discussed in Section 2.4, 452 comments received in five different ways were submitted prior to the close of the comment period:

- 105 Verbal comments at Public Scoping Meetings
- 82 Written comments at Public Scoping Meetings
- 152 Written comments and 1 digital audio comment via email
- 108 Written comments via US mail and hand delivered
- 4 Verbal comments on the Telephone Information Line

2.6.2 Summary of Substantive Comment

This section summarizes the comments received in verbal testimony at the Early Scoping meetings, written comment forms turned in at the Early Scoping meetings, via emails, in letters mailed to Metro and received on the Telephone Information Line. Table 2-1 through Table 2-4, summarize the comments from each of these input sources.

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.

Comments Related to Purpose and Need

Public comments were provided by 105 speakers at the five Early Scoping meetings and are summarized in Table 4.1. The types of comments made with regard to the Purpose and Need for transit improvements in the Westside Extension Transit Corridor Study Area focused on the difficulty associated with traveling by car or bus on the Westside due to extreme and often day-long congestion, and the growing recognition of the need for a mass transit alternative. There was also discussion of the need for local connections and shuttles to make the transit system more accessible to a wider range of residential and employment areas. The need for enhanced nighttime service, given the entertainment venues on the Westside was also mentioned by several speakers. The need for north-south connections and improvements was also a common comment.



Table 2-1. Summary of Comments of 134 Speakers at Five Public Early Scoping Meetings

Mode	Subway		Aerial/Monorail		LRT		BRT		Other
	Yes	No	Yes	No	Yes	No	Yes	No	
Mode	59	2	11	1	4	3	4	11	Underground BRT High Speed Rail At-grade
Stations	Le Conte/Westwood (2), Beverly Center/Cedars-Sinai (7), VA (2), Wilshire/Gayley/Lot 32, Center of Century City (4), LaBrea/Fairfax, LaBrea/Santa Monica, Santa Monica/Fairfax, San Vicente/Santa Monica, North/South Connections, Sunset/Fairfax (2), On UCLA Campus (1, The Grove (3), Plummer Park, Beverly Glen, La Cienega, Beverly Drive, Sunset./Highland, Rodeo Drive, West Hollywood, Santa Monica Pier, Bundy, 17th-20th Streets, No Station at Crenshaw or Irving or Windsor, No Station at Sunset/Fairfax								
Alignments	Wilshire		Santa Monica		Both ¹		Other		
	Yes	No	Yes	No	Yes	No			
Alignments	23	2	14		19			Burton Way N-S Route to Valley & LAX Rapid Bus on Olympic N-S H&H to Expo (2) Santa Monica Blvd Straight to DT Must go to the Sea (4) Not all the way to Santa Monica Don't zig-zag H&H to La Brea to Santa Monica H&H follow red car diagonal to Santa Monica Hollywood/Vine to Sunset to La Cienega Under LA County Club Burbank Airport to LAX via Hollywood Provide for express trains 3rd St Promenade connection to Expo Wilshire to Expo via Water Garden	
Issues	Parking at stations (4) Consider parallel arterial capacity Tunneling under historic homes, vibration (7) Don't let funding drive schedule Connection to LAX Need Local Connectors/Shuttles (4) Need nighttime service (4) Traffic Diversion associated w/ BRT (5) If Purple to sea, Expo on Venice Repair curb lanes used by buses Articulated buses cause congestion Incorporate bicycles in planning (3) Joint development potential of Division (7) Expand community outreach (outside study area, different formats, wider demographics)(3)						Include Olympic/Pico one-way Need N-S Connections (5) Drilling in methane area (3) Joint development can help pay Affect on green house gasses (2) Segment project to address funding (3) Speak w/ one voice in Washington (3) Questions ridership and user demographics Preserve pedestrian amenities on Wilshire Accidents on 6 th Street Study benefits of electric vehicles External costs of driving (accidents, health) Shadows and visual impacts associated with elevated trains (2) Earthquake safety Safety at stations (2)		
Evaluation Criteria	Benefits to community, including young people Ability to absorb growth, accommodate pedestrians, affect on green house gases, ability to generate riders on other systems Bicycle Safety, Travel Speed (2), Ability to Serve Job Centers, Overall Capacity Construction Safety in earthquake zones , System improvements								

¹ If they expressed support for both alignments, but also said "If only one can be built, I prefer X" they were counted under "Both" as well as under the corridor they supported if only one could be built.



Comment forms were completed by 82 people and submitted at the Early Scoping meetings or returned to Metro after the meetings and summarized in Table 2-2. The types of comments made with regard to the Purpose and Need for transit improvements in the Westside Extension Transit Corridor Study Area focused on traffic congestion and extended travel times on existing bus transit routes including Rapid and Rapid Express lines.

Table 2-2. Summary of 82 Written Early Scoping Meeting Comments

Mode	Subway		Aerial/Monorail		LRT		BRT		Other
	Yes	No	Yes	No	Yes	No	Yes	No	
Mode	59	3	6	0	1	3	3	8	Increase local service
Stations	Wilshire/Westholm (1) Connection to Expo (4) Santa Monica (6) Beverly Hills (5) Wilshire/Westwood (3) UCLA (6) Wilshire/Doheny (1) Grove/Farmers Market (1) Century City (7)			405 (2) Valley (1) Crenshaw (1) Wilshire/La Cienega (1) North/South (3) Downtown (1) San Vicente/Santa Monica (2) Wilshire/Santa Monica (1) Le Conte (1) West Hollywood (2)			Lincoln Boulevard (2) Rodeo/Beverly (1) Beverly Center (1) Wilshire/Fairfax (3) Hospitals (2) LAX and BUR (5) AVOID: La Brea Fairfax		
Alignments	Wilshire		Santa Monica		Both ²		Other		
	Yes	No	Yes	No	Yes	No			
Alignments	22	0	8	0	17	0			
Issues	Bike access and amenities (3) Traffic light synchronization Property values Signage and wayfinding (3) Ease of transfer Congestion caused by buses Connection with employment centers GPS Tracking Parking at station, Park/Ride options Increase in taxes				Line naming Station amenities Use of solar power Don't complete in phases Concerned about noise and vibration at the Spaulding and Sunset Squares, and Sunset Flats				
Evaluation Criteria	Express and rush hour services Noise/Vibration during construction and use Tunneling through residential neighborhoods (3) Density at stations Economic development opportunities Station power Station accessibility for bikes, strollers, and ADA								

Misc: questions/concerns regarding Exposition Phase 2 (6)

² If they expressed support for both alignments, but also said "If only one can be built, I prefer X" they were counted under "Both" as well as under the corridor they supported if only one could be built.



Email comments were received from 152 people during the Early Scoping period and summarized in Table 2-3. The types of comments made with regard to the Purpose and Need for transit improvements in the Westside Extension Transit Corridor Study Area focused on existing traffic congestion and the need for system connectivity.

Table 2-3. Summary of 152 Email Submissions

Mode	Subway		Aerial/Monorail		LRT		BRT		Other
	Yes	No	Yes	No	Yes	No	Yes	No	
Mode	73	3	1	0	10	2	5	3	Increase local bus service Increase DASH service Moving sidewalks Auto expressway under Wilshire Boulevard
Stations	VA hospital (2) Century City (5) UCLA (5) Cedar-Sinai Hospital West Hollywood (3) Hollywood (1) 20 th /Santa Monica Boulevard Veteran/Wilshire Connection with Expo Pico/Fairfax (1) Sunset/Fairfax (2) NOT Sunset/Fairfax (1)			Beverly Center (2) Grove/Farmers Market (2) Santa Monica (1) Santa Monica Community College (1) Pacific Coast Highway (1) LAX (2) Hollywood Bowl (1) Sepulveda Boulevard (1) 405 (1) Echo Park (1)			Westwood/Wilshire (5) Beverly Hills (4) 3 rd /Fairfax Wilshire/Fairfax		
Alignments	Wilshire		Santa Monica		Both ³		Other		
	Yes	No	Yes	No	Yes	No			
Alignments	34	1	15	1	8	9	La Brea to LAX (1) Olympic Boulevard (2) 405 (2) Hollywood/Highland (1) Connections to N/S Routes (3)		
Issues	Congestion Service availability (3) Noise and Vibration (8) Signage Sunset/Fairfax station location is a business (2) Economic Development opportunities (2) Timeliness of service System connectivity (6) Bike amenities (2) Express service Bus Lanes Increase taxes/Fees (5)								
Evaluation Criteria	Environmental concerns Noise and vibration under sunset/Spaulding square								

Misc: questions/concerns regarding Exposition Phase 2 (6)

³ If they expressed support for both alignments, but also said "If only one can be built, I prefer X" they were counted under "Both" as well as under the corridor they supported if only one could be built.



Letters were received from 108 persons and/or agencies, of which 98 letters were related to the purpose and need. Table 2-4 provides a summary of the letters and the complete set of letters is contained in the *Final Project Scoping Report (November 9, 2007)*. The letters focused on the alternatives to be studied and issues of concern to the authors, with little comment on the Purpose and Need for the project. The fact that the majority of the letter writers supported one or more of the alignments and modes, however, indicates that they perceive a need to provide a transit improvement in the Westside Extension Transit Corridor Study Area.

Table 2-4. Summary of 108 Written Letters and Comments

Mode	Subway		Aerial/Monorail		LRT		BRT		Other	
	Yes	No	Yes	No	Yes	No	Yes	No		
	71	0	4	0	3	0	2	0	More buses (8) Just bus (1) Circulator Street Car (2)	
Stations	Fairfax (5) La Brea (7) Western (1) Beverly Triangle (6) UCLA (10) Westwood (7) Constellation (7) Avenue of the Stars (7) Santa Monica Boulevard (11) Century City (19) 3 rd Street (5) 4 th Street (1) 20 th St (1)				Connection to Expo (9) Bundy (3) San Vicente (4) Grove/Farmers' Market (2) Crenshaw (6) Sunset (1) Santa Monica (4) LAX (4) Beverly Drive (4) La Cienega (4) Rodeo (1) North/South (8)			Beverly Hills (4) Museum Row (1) Century City Mall (1) Robertson (1) West Hollywood (4) Crescent Heights (1) San Fernando Valley (1) Dodger Stadium (1) Red line (1) Hollywood Bowl (1) VA (2) West of 405 (1)		
Alignments	Wilshire		Santa Monica		Both ⁴		Other			
	Yes	No	Yes	No	Yes	No				
	28	0	12	0	8	0	San Vicente (1) Sunset (3) Highland (2) Lincoln Boulevard (1) Olympic Boulevard (1)			
Issues	Serving higher density Pedestrian access Congestion Crime Noise and Vibration (8) Service Century City after 5:30 p.m. (8)					Bike access and amenities (2) Express service Construction impacts (3) Street closures/impacts on community events (marathon, filming, parades) Parking				
Evaluation Criteria	Area serviced Noise and Vibration (8) Environmental factors (additional people on the road, train and power station exhaust) Additional congestion to streets near stations System connectivity					Land use Additional land use opportunities (3) Fire/life/safety access (what happens if a fire truck is caught at a crossing gate?) Underground utilities Impacts to geologic and water table				

⁴ If they expressed support for both alignments, but also said "If only one can be built, I prefer X" they were counted under "Both" as well as under the corridor they supported if only one could be built.

Messages left on the telephone information line did not reflect comments about the study's Purpose and Need.

2.6.3 Comments Related to Alternatives

Suggested refinements resulting from Early Scoping were identified in Section 2.3.2. This section further describes the comments leading to these alternatives refinements including preferred modes, potential station locations, and possible route alignments.

2.6.3.1 Modes

The comments provided by speakers at the Early Scoping meetings strongly supported the subway mode. Fifty speakers expressed a preference for the subway, with only two opposed. Eleven speakers spoke in favor of a potential monorail elevated alternative and one person was opposed to the monorail. Four people mentioned support for light rail transit and three were opposed to it, largely due to concerns about traffic congestion with an at-grade mode. Several of the people speaking in favor of either monorail or LRT indicated they felt these were less expensive alternatives and could, therefore, be built more quickly. Four people expressed a preference for additional BRT service, but ten people were opposed to dedicated bus lanes.

Comment forms submitted by meeting attendees indicated a strong preference for the subway mode. Of those who expressed a mode preference, 85 percent (59 people) supported the subway mode, while three people were opposed to the subway. Six expressed a preference for the aerial/monorail mode, one person suggested LRT, and three supported BRT. LRT was opposed by three people and BRT was opposed by eight.

Comments received via email were overwhelmingly in favor of the subway mode. Seventy-three people expressed support for the subway and only three were opposed to the subway mode. Support was expressed for LRT in 10 emails, with two people opposing LRT. The BRT mode with dedicated lanes was supported in five and opposed in three emails. Only one person emailed in support of a monorail alternative.

Almost 90 percent of the letter writers who expressed a preference for a mode supported the subway alternative. Seventy-one letters supported the subway mode, with only four supporting aerial/monorail, three in favor of LRT and two advocating BRT. Letter writers did not offer opinions in opposition to modes, rather only support for their preferred mode, which was overwhelmingly subway.

2.6.3.2 Stations

People who spoke at the Early Scoping Meetings generally supported the potential station locations that were shown on the Potential Alignments and Stations board and on the PowerPoint presentation slide. However, some attendees suggested some additional stations as well. Five speakers suggested that a station near Cedars-Sinai Hospital and the Beverly Center was needed. Three people commented that the station in Century City should be south of Santa Monica Boulevard, closer to the center of Century City. There was support from two speakers for a station on the UCLA campus, or located close to campus at Westwood and LeConte. Two submitted comments supporting placement of a station by the I-405 overpass, or close to the Veterans' Administration Hospital. Two others supported a station located at The Grove/Farmers Market. There were also

comments in favor of a station on Wilshire at Bundy and on Wilshire between 17th and 20th Streets near the UCLA/Santa Monica Hospital. Opposition was also expressed by several speakers to a station on Wilshire at Crenshaw or elsewhere in the Park Mile Specific Plan segment of Wilshire Boulevard.

The comment forms included a map on the reverse side of the form and suggested that commenters sketch their preferred alignment and station locations. The comment forms can be viewed in the *Final Scoping Report (November 9, 2007)*. The station areas most frequently indicated on the comment forms included Century City (7), UCLA (6), Santa Monica (6) Beverly Hills (5), LAX or Burbank Airports (5), and a connection to the Expo LRT line (4). The only station area for which opposition was expressed was a station at Sunset/Fairfax.

Comments received via email mentioned many potential station locations. Those locations that were mentioned in more than one email included: Century City (5), UCLA (5), Westwood/Wilshire (5), Beverly Hills (4), West Hollywood (3), VA Hospital (2), Sunset/Fairfax (2), Beverly Center (2), The Grove/Farmers Market (2), and LAX (2). One email expressed opposition to a station at Sunset/Fairfax.

The station location most frequently mentioned in letters received by Metro was a Century City station. Nineteen letters mentioned the need for a station in Century City. The next most-mentioned station location was UCLA (10 comments), followed by the need for a connection to the Exposition LRT Corridor.

2.6.3.3 Alignments

Speakers at the Early Scoping meetings were strongly in favor of the Wilshire alignment, although almost an equal number were in support of both alignments, (Wilshire and Santa Monica) being built eventually.

Speakers also suggested several north-south alignments. These included an alignment from the San Fernando Valley to LAX, a connection from Hollywood and Highland to the Exposition Corridor, and Burbank Airport to LAX via Hollywood and 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, and connections to the Exposition Line either via the Third Street Promenade or near the Water Garden on 26th Street in Santa Monica. A group of speakers from the community just east of Fairfax Avenue, between Hollywood and Sunset Boulevards, advocated an alignment under Fairfax as they were concerned potential tunneling would damage their 1920s era homes.

Persons who completed comment forms preferred the Wilshire alignment. Twenty-two comments supported Wilshire, but almost as many (17) expressed support for both the Wilshire and Santa Monica alignments. Eight comment cards indicated Santa Monica Boulevard as the preferred alignment. Some comments indicated the need for north-south connections.

The Wilshire Boulevard alignment was the preference of the majority of persons who commented by email. Thirty-four people expressed a preference for the Wilshire alignment and only one person was opposed to that alignment. Fifteen emails supported the Santa Monica Boulevard alignment and one opposed the Santa Monica alignment. Support was expressed for both alignments in eight emails and nine opposed building both. Several emails suggested the need for north-south connections, including an alignment on La Brea to serve LAX and in the I-405 corridor. Two emails suggested an alignment along Olympic Boulevard.



Letter writers strongly supported the Wilshire alignment as their first choice. Twenty-eight letters supported the Wilshire alignment. Twelve were received in support of studying the Santa Monica alignment. Eight letters suggested that both alignments were appropriate for inclusion in this alternatives analysis. Other corridors that were mentioned included an alignment under Sunset Boulevard, Highland Avenue, San Vicente Boulevard, Lincoln, and Olympic Boulevards.

2.6.4 Comments Related to Evaluation Criteria

There were not many speakers at the Early Scoping meetings who addressed specific evaluation criteria that they felt should be used to assess the alternatives. Those that did mention evaluation criteria mentioned the need to assess community benefits, particularly for young people, and the ability of the alternatives to absorb the growth from additional demand over time, accommodate pedestrians, affect green house gas emissions, and generate ridership on other parts of the transit system. The overall capacity of the alternatives and the speed of the alternatives were also mentioned. The impacts of alternatives on bicycle safety were suggested as evaluation criteria, as was construction safety in earthquake zones.

Persons who completed comment cards suggested the need to evaluate noise and vibration of alternatives during construction and operations. Some also suggested that economic development opportunities and density around stations be considered.

Comments that were received in emails suggested that environmental concerns be key evaluation criteria. They also suggested that noise and vibration be considered in evaluating alternatives.

Evaluation criteria mentioned in letters included assessments of the area served by the alternative, noise and vibration (mentioned in eight letters), station area congestion, system connectivity, and opportunities for additional land use.

Comments Related to Scope of the Analysis

Some of the issues that commenters during the Early Scoping process said need to be addressed in the alternatives analysis included:

- Parking at stations
- Park-and-ride lots
- Street Closures and impacts on community events
- Parallel arterials – their capacity and the effect of diverting traffic to them with dedicated bus lanes
- Effect on congestion, including around stations
- Need for system connectivity
- Availability and timeliness of transit service
- Potential for express service
- Need for late night service
- Ease of transfers
- Congestion caused by buses



- Pedestrian and bicycle accessibility and amenities
- Americans with Disabilities Act (ADA) accessibility
- The affect of tunneling under homes, particularly older/historic homes
- Safety of drilling in the methane gas zones
- Seismic safety
- Impacts on geology and ground water
- Impacts on underground utilities
- Noise and vibration impacts
- Joint development potential and impacts of joint development
- Economic development opportunities
- Effects on property values
- Shadow and visual impacts associated with elevated structures
- Power/energy requirements
- Crime (safety issues)
- Construction impacts
- Possible segmentation due to funding constraints
- External costs (accidents, health) associated with the No Project Alternative

2.7 Universe of Alternatives Identified for Evaluation

A universe of alternatives evolved based on the mobility problem definition, the study purpose and need, previous studies and the scoping comments received. This universe of alternatives is illustrated in Figure 2-6. A wide range of potential options were brought into the initial screening.

2.8 Alternatives Advanced to Additional Screening

Based on scoping and the supportive investigations for the Westside Corridor study, a range of reasonable build alternatives were identified for a screening level evaluation. The alignments, stations, and transit technologies, including HRT, LRT, Monorail, and BRT proposed for alternative screening, are summarized below. In all, 17 build alternatives were developed in addition to the No Build and TSM alternatives.

2.8.1 No Build

The No Build Alternative (Figure 2-7) includes all existing highway and transit services and facilities and the committed highway and transit projects in the current Metro Long-Range Transportation Plan that are under construction and environmentally cleared, and the current Southern California Association of Governments' 2004 Regional Transportation Plan (RTP).

Proposed major highway improvements impacting the Westside Transit corridor between now and 2030 only include completing high occupancy vehicle (HOV) lanes on the I-405 Freeway between US 101 and the I-105 Freeway.

Figure 2-6. Universe of Alignments and Station Alternatives



WESTSIDE EXTENSION TRANSIT CORRIDOR STUDY

Figure 2-7. No Build Alternative





From a rail transit perspective, the Westside study area will continue to be served by the Purple and Red Metro Rail Lines along the eastern and northeastern 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 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. Of particular note are the Metro Rapid bus route additions and modifications for:

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

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

Relation to Other Ongoing Metro Studies

For purposes of this study and comparison of alternatives, the major fixed-guideway investments under study for the Exposition Phase 2 and Crenshaw-Prairie Transit corridors are not included in the No Build Alternative. The completion of the Metro Rapid Bus Program is included.

2.8.2 Transportation Systems Management

The TSM Alternative (Figure 2-8) 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

Figure 2-8. TSM Alternative



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 local bus routes will see frequency enhancements over the No Build during the peak period. These routes include:

- Sunset Boulevard (short line (SL) Westwood) (Line 2)
- Santa Monica Boulevard SL (Line 4)
- Beverly Boulevard SL (Line 14)
- West Third Street Limited (Line 16)
- Wilshire Boulevard-Westwood (Line 20)
- Vermont Avenue SL (Line 204)
- Western Avenue SL (Line 207)

In addition to the local bus routes described above, a series of Metro Rapid Bus routes will also be enhanced as part of the TSM Alternative. These routes include:

- Santa Monica Boulevard Metro Rapid Bus (Line 704)
- Beverly Boulevard Metro Rapid Bus (Line 714)
- Olympic Boulevard Metro Rapid Bus (Line 728)
- Vermont Avenue Metro Rapid Bus (Line 754)

The TSM Alternative is further described and illustrated in Section 2.11.3.

2.8.3 Heavy Rail Transit in Subway Alternatives

This section contains descriptions of the HRT alternatives proposed for screening that are subway based. Of the 17 build alternatives proposed, 13 fall into the category of HRT in subway. Information on each alignment (separated into three main groupings), station configurations, termini, operating plans and operating support facilities are described below.

2.8.3.1 Alignment Descriptions

Alignment descriptions and mapping to show all HRT subway alternatives for screening are described below. In order to reduce some redundancy in describing these alternatives, they have been subdivided into three main groups: 1) Wilshire Boulevard based alignment alternatives, 2) Santa Monica Boulevard alignment based alternatives and 3) combined or 'maximum' service alternatives that include both the Wilshire and Santa Monica Boulevards alignments. A key map for each of the 13 alternatives that involve HRT subway and a brief description of each one is also provided below.

Wilshire Boulevard based alignments: Of the 13 alternatives in the HRT subway major category, three are focused primarily along Wilshire Boulevard. They are Alternatives 1, 12, and 14, and they are depicted in Figure 2-9 and described following the map.

Figure 2-9. Wilshire Boulevard HRT Subway Alternatives





Alternative 1 – Wilshire Boulevard Alignment HRT Subway

- This alternative extends from the Metro Purple Line Wilshire/Western Station to 4th Street and Wilshire Boulevard in Santa Monica underground with 11 new stations in addition to the existing Wilshire/Western Metro Purple Line Station.
- The alignment is generally under Wilshire Boulevard with a direct connection at the Wilshire/Western Station.
- Refer to Figure 2-10.

Figure 2-10. Alternative 1 – Wilshire Boulevard Alignment HRT Subway





Alternative 12 – Wilshire Boulevard/Beverly Boulevard Centers HRT Subway

- This alternative extends via a direct connection from the Metro Purple Line Wilshire/Western Station to 4th Street and Wilshire Boulevard in Santa Monica underground with 11 new stations in addition to the existing Wilshire/Western Metro Purple Line Station.
- This alignment is generally under Wilshire Boulevard to La Brea Avenue, continues under La Brea Avenue to Beverly Boulevard, stays under Beverly Boulevard to Santa Monica Boulevard, continues under Santa Monica Boulevard to Century City, transitions to Wilshire Boulevard to serve Westwood and continues under Wilshire Boulevard to 4th Street in Santa Monica.
- Refer to Figure 2-11.

Figure 2-11. Alternative 12 – Wilshire Boulevard/Beverly Boulevard Centers HRT Subway





Alternative 14 – Wilshire Boulevard/Fairfax Avenue Centers HRT Subway

- This alternative extends via a direct connection from the Metro Purple Line Wilshire/Western Station to 4th Street and Wilshire Boulevard in Santa Monica underground with 12 new stations in addition to the existing Wilshire/Western Metro Purple Line Station.
- This alignment is generally under Wilshire Boulevard to Fairfax Avenue, continues under Fairfax Avenue to 3rd Street stays underground to 3rd Street/La Cienega Boulevard to serve Beverly Center/ Cedars Sinai Medical Center, transitions to Wilshire Boulevard at Beverly Boulevard, turns onto Santa Monica Boulevard to Century Boulevard, and returns to Wilshire Boulevard at Westwood where it continues under Wilshire Boulevard to 4th Street in Santa Monica.
- Refer to Figure 2-12.

Figure 2-12. Alternative 14 – Wilshire Boulevard/Fairfax Avenue Centers HRT Subway



Key comparisons between these three alternatives were ridership, cost, and impacts of serving the Wilshire Boulevard corridor exclusively as opposed to serving a portion of the Beverly Boulevard corridor between La Brea Avenue/Fairfax Avenue and Century City.

Santa Monica Boulevard based alignments: Of the 13 alternatives in the HRT subway major category, five (plus a station approach option) are focused primarily along Santa Monica Boulevard. They are Alternatives 4, 6, 7 (and 7A), 8 and 13 and they are depicted in Figure 2-13.

Figure 2-13. Santa Monica Boulevard HRT Subway Alternatives





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

- This alternative extends from the Metro Red Line at both the Universal City and Hollywood/Highland Stations to 4th Street, and Wilshire Boulevard in Santa Monica, with nine new stations in addition to the existing Metro Red Line Stations at Universal City and Hollywood/Highland.
- This underground alignment transitions from the Metro Red Line to West Hollywood at Fairfax Avenue and Santa Monica Boulevard continues under Santa Monica Boulevard to Century City, transitions to Wilshire Boulevard in Westwood and continues under Wilshire Boulevard to 4th Street in Santa Monica.
- Refer to Figure 2-14.

Figure 2-14. Alternative 4 – Santa Monica Boulevard Alignment HRT Subway





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

- This alternative extends from the Metro Red Line at the Hollywood/ Highland Station to 4th Street and Wilshire Boulevard in Santa Monica with 10 new stations.
- A transfer underground to a new station in the vicinity of Hollywood/Highland is included to transfer to/from the Red Line.
- This underground alignment transitions from the Metro Red Line at Hollywood/Highland, continues under Highland Boulevard to Santa Monica Boulevard, under Santa Monica Boulevard to Century City, transitions to Wilshire Boulevard and continues under Wilshire Boulevard to 4th Street in Santa Monica.
- Refer to Figure 2-15.

Figure 2-15. Alternative 6 – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Highland Red Line Connection



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

- This alternative extends from the Metro Red Line at the Hollywood/Highland Station to 4th Street and Wilshire Boulevard in Santa Monica with nine new stations in addition to the existing Hollywood/Highland Station.
- This underground alignment transitions from the Metro Red Line at Hollywood/Highland, to Santa Monica Boulevard at Fairfax Avenue north of the Galaxy shopping center, continues under Santa Monica Boulevard to Century City, transitions to Wilshire Boulevard and continues under Wilshire Boulevard to 4th Street in Santa Monica.
- Alternatives 7 and 7a differ in approaches to the area adjacent to the Metro Red Line Hollywood/Highland Station. There are potential impacts to the Galaxy shopping center in that area under Alternative 7. Alternative 7A represents a slight shift to avoid the shopping center impacts.
- Continuing east-west service between Santa Monica and the existing Metro Red Line is provided by a direct connection at Hollywood/Highland.
- Refer to Figure 2-16.

Figure 2-16. Alternative 7 – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Highland Red Line Connection/Galaxy North





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

- This alternative extends from the Metro Red Line at the Hollywood/ Highland Station to 4th Street and Wilshire Boulevard in Santa Monica with nine new stations in addition to the existing Hollywood/Highland Station.
- This underground alignment transitions from the Metro Red Line at Hollywood/Highland, to Santa Monica Boulevard at Fairfax Avenue south of the Galaxy shopping center, continues under Santa Monica Boulevard to Century City, transitions to Wilshire Boulevard and continues under Wilshire Boulevard to 4th Street in Santa Monica.
- Alternatives 7 and 7A differ in approaches to the area adjacent to the Metro Red Line Hollywood/Highland Station. There are potential impacts to the Galaxy shopping center in that area under Alternative 7. Alternative 7A represents a slight shift to avoid the shopping center impacts.
- Continuing east-west service to Santa Monica to/from the existing Metro Red Line is provided by a direct connection.
- Refer to Figure 2-17.

Figure 2-17. Alternative 7A – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Highland Red Line Connection/Galaxy South



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

- This alternative extends from the Metro Red Line at the Hollywood/ Vine Station to 4th Street and Wilshire Boulevard in Santa Monica with nine new stations in addition to the existing Hollywood/Highland Station.
- This underground alignment transitions from the Metro Red Line at Hollywood/Vine to Santa Monica Boulevard at Fairfax Avenue, continues under Santa Monica Boulevard to Century City, transitions to Wilshire Boulevard and continues under Wilshire Boulevard to 4th Street in Santa Monica.
- Continuing east-west service to Santa Monica to/from the existing Metro Red Line is provided by a direct connection.
- Refer to Figure 2-18.

Figure 2-18. Alternative 8 – Santa Monica Boulevard Alignment HRT Subway with Hollywood/Vine Red Line Connection



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

- This alternative extends from the Metro Red Line at the Hollywood/ Highland Station to 4th Street and Wilshire Boulevard in Santa Monica with 10 new stations in addition to the existing Hollywood/Highland Station.
- The alignment extends from the Hollywood/Highland Metro Red Line Station under Santa Monica Boulevard, San Vicente Boulevard, and Wilshire Boulevard to 4th Street in Santa Monica.
- Continuing east-west service to Santa Monica to/from the existing Metro Red Line is provided by a direct connection.
- Refer to Figure 2-19.

Figure 2-19. Alternative 13 – Santa Monica/San Vicente/Wilshire Boulevards HRT Subway


Of the five primary alternatives in the Santa Monica Boulevard based group, four vary with regard to the alignment approach as connections are made to and from the existing Metro Red Line in the vicinity of the Hollywood/Highland Station. Alternative 4 has an eastbound leg approaching the Hollywood/Highland Station from a new station at Fairfax Avenue and Santa Monica Boulevard. The westbound leg transitions from the Universal City Metro Red Line Station and, as shown, also connects at the new station at Fairfax Avenue and Santa Monica Boulevard. Alternative 6 enters the existing Red Line from the south near the Hollywood/Highland Station but because of engineering constraints does not physically connect at that location, thereby requiring a transfer. Alternative 7 (plus its approach option 7A) assumes the eastbound approach leg from Alternative 4 operates in both directions. At issue is the potential impact on the Galaxy shopping center in that area so Alternative 7A represents a slight shift to avoid the shopping center impacts. Alternative 8 moves the connection to and from the existing Metro Red Line to the Hollywood/Vine Station to analyze

the advantages and disadvantages of this shift. Alternatives 4, 6, 7 (and 7A) and 8 all include nine new stations.

These four alternatives share a common alignment from the proposed station at Fairfax Avenue and Santa Monica Boulevard to a western terminus at Wilshire Boulevard and 4th Street in downtown Santa Monica. The evaluation of these alternatives helped decide the best way to connect to the existing Metro Red Line at Hollywood/Highland.

The fifth alternative in the Santa Monica Boulevard based group, Alternative 13, shares the same approach to and from the existing Metro Red Line as Alternative 7, as well as the same alignment from the Santa Monica at Century City station to the western terminus as the other four alternatives. Alternative 13 differs where it serves Beverly Hills between San Vicente Boulevard and Wilshire Boulevard. At San Vicente Boulevard, the alternative turns southeast to La Cienega Boulevard, heads southwest under Wilshire Boulevard and Beverly Drive, and then rejoins the common segment under Santa Monica Boulevard at Century City. This alternative helped evaluate the merits of serving Cedars-Sinai Medical Center, Beverly Center and portions of Beverly Hills closer to Wilshire Boulevard as compared to Santa Monica Boulevard.

Combined Wilshire and Santa Monica based alignments: Of the 13 alternatives in the HRT subway major category, five represent maximum coverage alternatives utilizing both the Wilshire and Santa Monica corridors. The five are Alternatives 9, 10, 11, 15 and 16. They are shown on Figure 2-20.

Figure 2-20. Combined Wilshire/Santa Monica HRT Subway Alternatives





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

- This alternative extends from the Metro Purple Line Wilshire/ Western Station and from the Metro Red Line at both the Universal City and Hollywood/Highland Stations to 4th Street and Wilshire Boulevard in Santa Monica underground with 13 new stations in addition to the three existing Metro Stations.
- See Alternatives 1 and 4 bulleted summaries and refer to Figure 2-21.

Figure 2-21. Alternative 9 – Wilshire/Santa Monica Boulevards Combined HRT Subway (Alt 1 + Alt 4)





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

- This alternative extends from the Metro Purple Line Wilshire/ Western Station and from the Metro Red Line at the Hollywood/ Highland Station to 4th Street and Wilshire Boulevard in Santa Monica underground with 13 new stations in addition to the two existing Metro Stations.
- See Alternatives 1 and 7 bulleted summaries above refer to Figure 2-22.

Figure 2-22. Alternative 10 – Wilshire/Santa Monica Boulevards Combined HRT Subway (Alt 1 + Alt 7)





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

- This alternative extends 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 underground with 14 new stations in addition to the existing Wilshire/Western Metro Purple Line Station.
- See Alternatives 1 and 6 bulleted summaries above and refer to Figure 2-23.

Figure 2-23. Alternative 11 – Wilshire/Santa Monica Boulevards Combined HRT Subway (Alt 1 + Alt 6)





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

- This alternative extends 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 underground with 14 new stations in addition to the existing Metro Stations..
- See Alternatives 13 and 14 bulleted summaries above and refer to Figure 2-24.

Figure 2-24. Alternative 15 – Wilshire/Santa Monica Boulevards Combined Centers HRT Subway (Alt 13 + Alt 14)



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

- This alternative extends 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 underground with 15 new stations including transfer station at the Hollywood/Highland Metro Red Station.
- See Alternatives 13 and 14 bulleted summaries above and refer to Figure 2-25.

Figure 2-25. Alternative 16 – Wilshire/Santa Monica Boulevards Combined Centers HRT Subway (Alt 13 + Alt 14) with transfer at Hollywood/Highland



The primary differences in the five maximum coverage alternatives include various ways to connect with the existing Metro Red Line in the vicinity of the Hollywood/Highland Station as well as various ways to serve the ‘land use centers’ in an area bounded by Fairfax Avenue, Beverly Drive, Santa Monica Boulevard, and Wilshire Boulevard. Alternative 9 has an eastbound leg approaching the Hollywood/Highland Station from a new station at Fairfax Avenue and Santa Monica Boulevard. The westbound leg transitions from the Metro Red Line Universal City Station and, as shown, also connects at the new station at Fairfax Avenue and Santa Monica Boulevard. In addition, Alternative 9 extends from the current Metro Purple Line at Wilshire/Western and continues under Wilshire Boulevard to Beverly Drive, then joins with the Santa Monica branch that extends southwest from the Fairfax Station and continues to the Westwood Boulevard Station at Wilshire Boulevard, continuing under Wilshire Boulevard to 4th Street in downtown Santa Monica. Alternative 10 follows the same path as Alternative 9, except for its connection with the existing Metro Red Line.

Alternative 10 assumes the eastbound approach leg from Alternative 9 operates in both directions. Likewise, Alternative 11 follows the same path as Alternative 9, except for its connection with the existing Metro Red Line. Alternative 11 enters the existing Metro Red Line from the south near the

Hollywood/Highland Station, but because of engineering constraints does not physically connect at that location, thereby requiring a physical transfer. Regarding number of stations, Alternatives 9, 10 and 11 have 13 new stations.

Alternatives 15 and 16 are designed to test the effectiveness of serving different 'land use centers' near the middle of the study area, assuming both the Santa Monica and Wilshire corridors are served by high capacity transit. Alternative 15 transitions from the Metro Red Line and the Metro Purple Line just like Alternative 10; however, it differs in key two respects. First, it leaves the Santa Monica alignment at San Vicente Boulevard, heads southeast to La Cienega Boulevard, then southwest to Beverly Drive and Wilshire Boulevard before joining the common segment to all alternatives in this group at the Century City station under Santa Monica Boulevard. Second, it leaves the Wilshire Boulevard alignment at Fairfax Avenue, turns north toward Beverly Boulevard, west to San Vicente Boulevard, and then transitions southwest to Beverly Drive and Wilshire Boulevard. The only difference between Alternatives 15 and 16 is that Alternative 16 transitions to and from the existing Metro Red Line similar to Alternative 11, requiring a physical transfer because of engineering constraints.

2.8.3.2 Stations

All subway stations are proposed to have street-level entrances comprised of vertical circulation elements that bring patrons to a mezzanine level where the ticketing functions are located. The platforms are one level below the mezzanine level. The platform widths and the widths of the stairs, escalators and emergency exits are to be determined by the patronage data and ADA required clearances.

The station platforms will be approximately 450 feet long and will allow level-boarding for full accessibility. The stations will consist of either center or side platforms. Center platform stations have a single platform that allows passengers to access trains from either direction from the same platform. This configuration makes it easier for passengers to make cross-platform transfers and improves the ease of use by passengers using the system. Side-platform stations have platforms on either side of the tracks with separate entrances to each platform. A side platform configuration requires that patrons transfer to a separate and different platform to access trains going in opposite directions.

All platforms will be fully accessible and will comply with the ADA. Platforms will be well-lighted and include amenities such as seating, trash receptacles, artwork, signage and safety and security equipment, including closed circuit television (CCTV), public announcement (PA) system, passenger assistance telephones (PTEL), and a transit passenger information system (TPIS) that will provide real-time information as currently being installed by Metro. The fare collection area includes ticket vending machines (TVM) and information cases.

2.8.3.3 Termini

All HRT subway alternatives for screening have a common western terminus at the vicinity of 4th Street and Wilshire Boulevard underground. At the current western terminus of the Metro Purple Line at Wilshire/Western Station, all HRT subway alternatives assume a continuation underground along Wilshire Boulevard.

There are a number of alternative termini being considered to solve the transition to and from the existing Metro Red Line in the vicinity of the Hollywood/ Highland Station. These options (as shown in previous figures) assume an extension from the Hollywood/Highland Station, the Hollywood/Vine Station or a split configuration using both the Hollywood/Highland and the

Universal City Stations. The screening analysis provides additional information on which of these termini makes the most sense considering ridership, costs and other impacts.

2.8.3.4 Operations Plans

Conceptual operating plans for the subway HRT alternatives were developed for ridership forecasting and capital and operating cost estimating purposes. All lines would operate seven days per week, including holidays. Hours of service would be similar to those operated on the existing Metro Orange, Purple, Red, Blue, and Gold Lines. Service would be provided from approximately 4:30 a.m. to 1:30 a.m., seven days a week. Weekday service in 2030 for new line segments would operate during peak periods of 6:00 to 9:00 a.m. and 3:00 to 7:00 p.m. during the off-peak midday period between 9:00 a.m. to 3:00 p.m. Off peak service early morning and late night periods would occur from 5:00 to 6:00 a.m. and 7:00 p.m. to 1:00 a.m.

For the Wilshire Boulevard Alternatives 1, 12, and 14, beginning at the Wilshire/Vermont transfer station, in the peak periods Metro Red Line trains would run every 5 minutes to/from North Hollywood. The proposed Metro Purple Line extension to Santa Monica will have 3 and 1/3 minute headways in the peak periods. All segments would operate with 10 minute headways in off peak periods.

For the Santa Monica Boulevard Alternatives, the operating plan is devised such that a comparable peak and off peak service is provided for Alternatives 4, 6, 7, 7A, 8, and 13 as for Wilshire: 3 and 1/3 minute peak period service and 10 minute off peak service.

Finally, for the combined or maximum service group involving both Wilshire and Santa Monica Boulevards Alternatives 9, 10, 11, 15, and 16, the operating plans become more complex. All Wilshire segments before the merge with the Santa Monica segments at Century City/Beverly Hills have a 10 minute peak period and 20 minute off peak period frequency.

The Santa Monica Boulevard segments to/from Century City/Beverly Hills vary with peak period headways for Alternative 9 at 3 and 1/3 minutes, off peak of 10 minutes; peak period headways for Alternatives 10 and 15 at 10 minutes, off peak of 20 minutes; and peak period headways for Alternatives 11 and 16 at 5 minutes, off peak of 10 minutes.

These frequencies directly impact the service levels on the common segments from Century City/Beverly Hills to downtown Santa Monica. In that segment the peak period headways for Alternative 9 is 2 minutes, off peak of 10 minutes; peak period headways for Alternatives 10 and 15 is 3 and 1/3 minutes, off peak of 10 minutes; and peak period headways for Alternatives 11 and 16 is 2 and 1/2 minutes, off peak 10 minutes.

Select modifications to existing bus routes are also proposed to provide enhanced service for bus to rail transfers for all HRT subway alternatives. These route and frequency changes will be reflected in the ridership and cost analysis as part of the screening and subsequent detailed evaluation of the alternatives.

2.8.3.5 Operations Support Facilities

The HRT alternatives will not require a new maintenance and storage facility to support the required fleet as there is sufficient capacity and expansion capability at Metro's existing rail maintenance facility except for Alternative 6, which does not connect directly to the Metro Red Line/Metro Purple Line system and would therefore not be able to access the existing HRT storage yard in Downtown Los Angeles.

2.8.4 Light Rail, Monorail and Heavy Rail Elevated Alternatives

This section provides a description of the elevated alternatives proposed for alternative screening. Information is provided to describe the basic alignments, types of stations, variations in termini (if any), proposed operating plans, and operating support facility needs. The characteristics of the elevated alternatives predominantly vary only by technology application: heavy rail, light rail, or monorail. The salient characteristics of the HRT and LRT technologies were presented in Section 2.2. It is noted that even though LRT can operate in at-grade configuration and often does, LRT at-grade is not included in the analysis because it cannot operate effectively enough in this corridor to provide a travel time advantage over BRT and will be much more expensive.

As the Monorail mode was introduced during the public scoping process, it is worth noting some basic assumptions for this technology for purposes of this analysis.

Monorail is a fixed guideway transit mode in which a series of electrically propelled vehicles straddle atop a single guideway beam or straddle bent structure. The trains generally consist of permanently coupled cars having suspension, propulsion and control equipment in common. Electric power is generally picked up by carbon collectors on the bottom of the vehicle in contact with a bus bar mounted on the side of the guideway beam. Vehicles can be operated with drivers or in totally automated mode.

The guideway for monorail is typically elevated, since it must be totally grade separated from all other traffic. Emergency egress from monorail vehicles has historically been a problem without the addition of emergency access walkways added to the guideway or onboard inflatable slides and emergency hatches that permit passenger movement from a disabled vehicle to adjacent vehicles or to ground level.

A disadvantage of Monorail systems has been their inability to switch tracks efficiently. Switching operations are often slow and maintenance intensive. As a result Monorail systems have been limited to simple loop and shuttle systems. An example application is pictured in Figure 2-26 from the resort corridor in Las Vegas. Additional key features are speeds up to 45 mph, train lengths up to six cars, and high level platform stations. Often, the vehicle and guideway designs are proprietary in nature limiting procurement opportunities.

Figure 2-26. Example Las Vegas Monorail Application



2.8.4.1 Alignment Descriptions

A total of three elevated configurations (Alternatives 2, 3, and 5) are proposed for screening and are illustrated graphically in Figure 2-27. For each alternative, three modes are common: HRT, LRT, and Monorail. A key map is provided next with a brief description of the three alternatives followed by more descriptive information.

Figure 2-27. HRT, LRT and Monorail Elevated Alternatives



WESTSIDE EXTENSION TRANSIT CORRIDOR STUDY

Alternative 2 – Wilshire Boulevard Alignment HRT Elevated

- This alternative extends from the Metro Purple Line Wilshire/Western Station to 4th Street and Wilshire Boulevard in Santa Monica elevated with 11 new stations in addition to a connection with the existing Wilshire/Western Metro Purple Line Station.
- The alignment is elevated above Wilshire Boulevard to Santa Monica Boulevard, above Santa Monica Boulevard to Westwood Boulevard, above Westwood Boulevard to Wilshire Boulevard and above Wilshire Boulevard to 4th Street in Santa Monica.
- To transition from subway to elevated, the alignment requires a major portal between the existing Wilshire/Western Metro Purple Line Station and the proposed Wilshire/Crenshaw Station.
- Refer to Figure 2-28

Figure 2-28. Alternative 2 – Wilshire Boulevard Alignment HRT Elevated




Alternative 3 – Wilshire Boulevard Alignment LRT/Monorail Elevated

- This alternative extends from the Metro Purple Line Wilshire/ Western Station to 4th Street and Wilshire Boulevard in Santa Monica elevated with 12 new stations.
- The alignment is elevated above Wilshire Boulevard to Santa Monica Boulevard, above Santa Monica Boulevard to Westwood Boulevard, above Westwood Boulevard to Wilshire Boulevard and above Wilshire Boulevard to 4th Street in Santa Monica.
- To transition from subway to elevated, the alignment requires a physical transfer between the existing Wilshire/Western Metro Purple Line Station and the proposed Wilshire/Western elevated station.
- Refer to Figure 2-29

Figure 2-29. Alternative 3 – Wilshire Boulevard Alignment LRT/Monorail Elevated



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

- This alternative extends from the Metro Red Line Hollywood/ Highland Station elevated to Wilshire Boulevard and 4th Street in Santa Monica with 10 new stations.
- The alignment heads south from the Hollywood/Highland Station above Highland Avenue to Santa Monica Boulevard, above Santa Monica Boulevard to Westwood Boulevard, above Westwood Boulevard to Wilshire Boulevard and then above Wilshire Boulevard to 4th Street in Santa Monica.
- To transition from any of the mode choices (HRT, LRT or Monorail Elevated), the alignment requires a physical transfer between the existing Hollywood/Highland Metro Red Line Station and the proposed Hollywood/Highland station.
- This alternative assumes HRT, LRT or Monorail modes.
- Refer to Figure 2-30.

Figure 2-30. Alternative 5 – Santa Monica Boulevard Alignment HRT, LRT, Monorail Elevated


As shown in Figure 2-27, all alternatives share a common alignment between the intersection of Wilshire and Santa Monica Boulevards and the western terminus at 4th Street in downtown Santa Monica. Separate alternatives are proposed which use Wilshire Boulevard east of Santa Monica Boulevard (Alternatives 2 and 3) and which use Highland Avenue and Santa Monica Boulevard (Alternative 5) northeast of the Wilshire/Santa Monica Boulevards intersection. The elevated alignments will be either in the center or on one side of the roadway. Station location, building access, traffic considerations, and opportunities for column placement to support the elevated structure, among other considerations will ultimately help decide the final horizontal location.

The portion of Wilshire Boulevard utilized by Alternatives 2 and 3 to the east of the Wilshire/Santa Monica Boulevards intersection begins at the Wilshire/Western Metro Purple Line Station. Alternative 2 assumes HRT and in this case the alignment transitions out of the subway to an elevated configuration and continues west toward Santa Monica Boulevard, then turns southwest on Santa Monica Boulevard to Westwood Boulevard, heads northwest on Westwood Boulevard back to Wilshire Boulevard and then southwest to 4th Street in downtown Santa Monica. The only difference between Alternatives 2 and 3 is that Alternative 3 assumes either LRT or Monorail which requires a transfer from the end of the Metro Purple Line at the Wilshire/Western Station to connect with Alternative 3. Alternative 2 assumes 11 elevated stations and Alternative 3 assumes 12 elevated stations.

The portion of Highland Avenue and Santa Monica Boulevard used by Alternative 5 to the northeast of the Wilshire/Santa Monica Boulevards intersection begins in the vicinity of the Hollywood/Highland Metro Red Line Station. Due to engineering constraints, it is not possible to seamlessly transition from a subway to an elevated configuration in this area. Therefore, all modes (HRT, LRT, and Monorail) require a physical transfer. This transfer would take place along Highland Avenue north of Sunset Boulevard as close to the Hollywood/Highland Station entrances as possible. The alignment would then continue south on Highland Avenue to Santa Monica Boulevard, continue west and then southwest along Santa Monica Boulevard to Wilshire Boulevard, and then continue on the elevated alignments' common segment to downtown Santa Monica.

2.8.4.2 Stations

The station configurations will vary slightly by technology primarily because of the various vehicle dimensions and possible train lengths. The amount of station amenities, such as seating, trash receptacles, and signage, should only vary as a result of the platform lengths required. HRT systems contain more vehicles in a trainset, which requires a longer platform and, thus, a greater number of station amenities. Comparatively, LRT trains contain fewer cars and require shorter platforms, so fewer amenities are needed.

The elevated stations are comprised of platforms that will vary in length by transit technology and will allow level-boarding for full accessibility. The stations will consist of either center or side platforms. Center platform stations have a single platform that allows passengers to access trains from either direction from the same platform. This configuration makes it easier for passengers to make cross-platform transfers and improves the ease of use by passengers using the system. Side-platform stations could have platforms on either side of the tracks with separate entrances to each platform or have access from an intermediate concourse level above grade. A side platform configuration requires that patrons transfer to a separate and different platform to access trains going in opposite directions.

All platforms would be fully accessible and will comply with the ADA. Outdoor platforms would be well-lighted and include amenities such as canopies that cover a minimum of 30 percent of the platform area, seating, bike lockers and bike racks, trash receptacles, artwork, signage and safety and security equipment, including CCTV, a PA system, PTEL, and a TPIS similar to what is being installed now on the Metro Gold Line Eastside Extension. The fare collection area includes TVM and information cases.

The elevated station structures will be supported by columns spaced approximately 80 to 120 feet depending on the transit technology employed. The platforms will be accessed either directly at grade

or from an intermediate concourse above grade through vertical circulation elements (i.e., stairs, escalators, or elevator). Platform sizes are determined by ADA clearances at the stairs, escalators or elevator structures, and exiting requirements in compliance with Metro Design Criteria based on patronage data and car dimensions.

2.8.4.3 Termini

For all elevated alternatives only slight variations in alignment termini exist. For Alternatives 2 (HRT) and 3 (LRT and Monorail), the alignments begin at the Wilshire/Western Metro Purple Line Station and end at Wilshire Boulevard at 4th Street in downtown Santa Monica. Alternative 2 (HRT) assumes that the Metro Purple Line will transition from below grade to above grade thereby providing a smooth transition without requiring a transfer. Because of the need to transfer to a different technology, Alternative 3 begins in an elevated configuration near the Wilshire/Western Station, thereby requiring a physical transfer from the end of the Metro Purple Line in subway to either an elevated light rail or monorail train.

Alternative 5 (HRT, LRT, and Monorail) begins in the vicinity of the Hollywood/Highland Metro Red Line Station and, like Alternatives 2 and 3, terminates at Wilshire Boulevard and 4th Street in downtown Santa Monica. Because of space and geometry constraints it is not practical to transition HRT from below grade to elevated and continue along Highland Avenue. Therefore, all technologies in this alternative assume a physical transfer between the Hollywood/Highland subway station to a new elevated station in the immediate vicinity.

2.8.4.4 Operations Plans

Conceptual operating plans for the elevated HRT, LRT and Monorail alternatives have been developed for ridership forecasting and capital and operating cost estimating purposes. All lines would operate seven days per week, including holidays. Hours of service would be similar to those operated on the existing Metro Orange, Purple, Red, Blue, and Gold Lines. Service would be provided from approximately 4:30 a.m. to 1:30 a.m., Monday through Sunday. Weekday service in 2030 for new line segments would operate during peak periods (i.e., 6:00 to 9:00 a.m. and 3:00 to 7:00 p.m.) and during the off-peak midday period (i.e., 9:00 a.m. to 3:00 p.m.). Service would be offered during the early morning and late night periods (i.e., 4:30 to 6:00 a.m. and 7:00 p.m. to 1:30 a.m.).

Several different LRT operating plans were developed based on the proposed eastern termini at Wilshire/Western (Alternatives 2 and 3) or Hollywood/Highland (Alternative 5). The alternative with a direct connection to the Metro Purple Line at Wilshire/Western (Alternative 2) would allow the proposed Westside Extension Transit Corridor HRT option to interline with the existing Metro Purple Line and operate to downtown Santa Monica. All other elevated alternatives cannot connect to the Metro Purple or Red Lines, except by transfer.

The operating plans for the Wilshire Boulevard Alignment (Alternatives 2 and 3) provide for the operation of a single line operating from end to end and stopping at all intermediate stations between Western Avenue and 4th Street in downtown Santa Monica. The line would operate at 3 and 1/3-minute and 10-minute frequencies during the peak and off-peak periods, respectively. The HRT mode affords a seamless transition from subway to an elevated configuration.

The operating plan for the Santa Monica Boulevard Alignment (Alternative 5) provides for the operation of a single line operating from end to end and stopping at all intermediate stations

between Hollywood/Highland and 4th Street in downtown Santa Monica. The frequencies of service would be 3 and 1/3 minutes and 10 minutes during peak and off-peak periods, respectively. All mode alternatives (HRT, LRT and Monorail) require a physical transfer in the vicinity of the Hollywood/Highland Metro Red Line Station.

Select modifications to existing bus routes are also proposed to provide enhanced service for bus to rail transfers for all elevated alternatives. These route and frequency changes will be reflected in the ridership and cost analysis as part of the screening and subsequent detailed evaluation of the alternatives.

2.8.4.5 Operations Support Facilities

Most of the HRT elevated alternatives will not require a new maintenance and storage facility to support the required fleet, but the LRT and Monorail Alternatives (Alternative 5) will. A new proposed vehicle maintenance and storage facility, either for LRT or Monorail, would be used for service and maintenance of the vehicles and as a storage area for vehicles that are not in service. Metro is very familiar with LRT maintenance requirements, but not familiar with such requirements for Monorail. Potential sites for the proposed facility and their unique requirements will be identified for consideration during the detailed definition of the alternatives, as necessary.

2.8.5 BRT Alternative

The BRT Alternative provides for new transit services in the Westside Transit Corridor traveling in exclusive curb lanes during peak periods. The BRT services would be operated by low-floor, compressed natural gas powered articulated vehicles with multi-door boarding. Enhanced BRT stops and stations would be constructed for passenger access to the system. The stations for access to the BRT services would be located approximately 1-mile apart. Figure 2-31 illustrates the BRT Alternative to be tested during screening. The sections below provide a more detailed discussion of this alternative. BRT in the median of Wilshire Boulevard was considered and rejected in the 2002 Wilshire BRT EIR.

Figure 2-31. Alternative 17 – BRT Alternative



2.8.5.1 Alignment Description

The BRT alternative consists of a specially operated dedicated peak period curb lane 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 Westwood Boulevard with nine 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. A summary map with a brief description of the BRT alternative is provided below before a more detailed description of the BRT alternative is provided.

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 providing service to downtown Santa Monica on both Wilshire and Santa Monica Boulevards.
- 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 Monica Boulevard to Westwood Boulevard and Wilshire Boulevard (Line 3).
- Line 1 has 15 stops, Line 2 has 13 stops, and Line 3 has nine stops.
- Refer to Figure 2-31.

Both branches of the Santa Monica BRT Line begin with a street level transfer above the Hollywood/Highland Metro Red Line Station. The BRT Line continues south on Highland Avenue toward Santa Monica Boulevard. Once on Santa Monica Boulevard, the main line continues to 4th Street in downtown Santa Monica. The branch line turns northwest on Westwood Boulevard and terminates at Westwood and Wilshire Boulevards.

The third section of the BRT alternative starts as a street level transfer above the Wilshire/Western Metro Purple Line Station and continues along Wilshire Boulevard, crosses Santa Monica Boulevard, and continues on Wilshire Boulevard to Ocean Drive, with a turn back along Ocean Drive to Colorado Avenue and 5th Street in downtown Santa Monica.

2.8.5.2 Stations

BRT stations would be located at frequent locations along the alignment, approximately 1 mile apart. The BRT stations would be at-grade stations that are comprised of two separate platforms along the alignment, one for each direction of travel. The station platforms would be of sufficient length to accommodate three conventional (40 feet and 45 feet) buses or two articulated (60 feet) buses. The BRT platforms would accommodate low floor vehicles to improve the boarding and alighting process and help reduce vehicle travel and dwell times.

Fare collection equipment, consisting of ticket vending machines and Stand Alone Validators (SAV) would be provided at each platform where boarding occurs. Canopies would partially cover portions of the platforms, including the fare collection area. Platforms would be well-lighted and include amenities such as seating, bike lockers and bike racks, trash receptacles, artwork, signage and safety and security equipment, including CCTV, PA system, PTEL, and Variable Message Signs (VMS) that would provide real-time information.

2.8.5.3 Termini

The BRT Alternative provides for the operation of two lines operating from end to end stopping at all intermediate stations (Lines 1 and 3) and one branch line serving Westwood (Line 2). The two lines going end to end serve the Wilshire corridor and the Santa Monica corridor respectively. The Wilshire Line (Line 1) would begin with a street level transfer at the Wilshire/Western Metro Purple Line Station and end at 4th Street in downtown Santa Monica. The Santa Monica Line (Line 3) would begin with a street level transfer at the Hollywood/Highland Metro Red Line Station and follow Santa Monica Boulevard to 4th Street in downtown Santa Monica. The branch line (Line 2) serving Westwood would begin like the Santa Monica Line and at Westwood Boulevard turn northwest to Wilshire Boulevard.

2.8.5.4 Operations Plans

A conceptual operating plan has been developed for the BRT Alternative for ridership forecasting and capital and operating cost estimating purposes. The BRT Lines would operate seven days per week, including holidays. Hours of service would be similar to those operated on the existing Metro Orange, Purple, Red, Blue, and Gold Lines. Service would be provided from approximately 4:30 a.m. to 1:30 a.m., Monday through Sunday. Weekday BRT service in 2030 for the Wilshire Line BRT segment would operate approximately every 2.5 minutes during peak periods in an exclusive curbside lane (i.e., 6:00 to 9:00 a.m. and 3:00 to 7:00 p.m.) and every 5 minutes during the off-peak periods, but non exclusive similar to the 720 Metro Rapid bus service today. For both the Santa Monica Boulevard alignment BRT Line segments, service is to be provided every 5 minutes in an exclusive curbside lane during peak periods only. Service will operate like the 704 Metro Rapid bus service in off peak periods.

2.8.5.5 Operations Support Facilities

No new vehicle maintenance and storage facilities would be required to support the expanded vehicle fleet required by the BRT Alternatives. The vehicles would be maintained and stored at existing Metro

facilities, which may need some expansion. Capital and operating costs associated with operations support facilities will be estimated as part of the evaluation of alternatives later in the project.

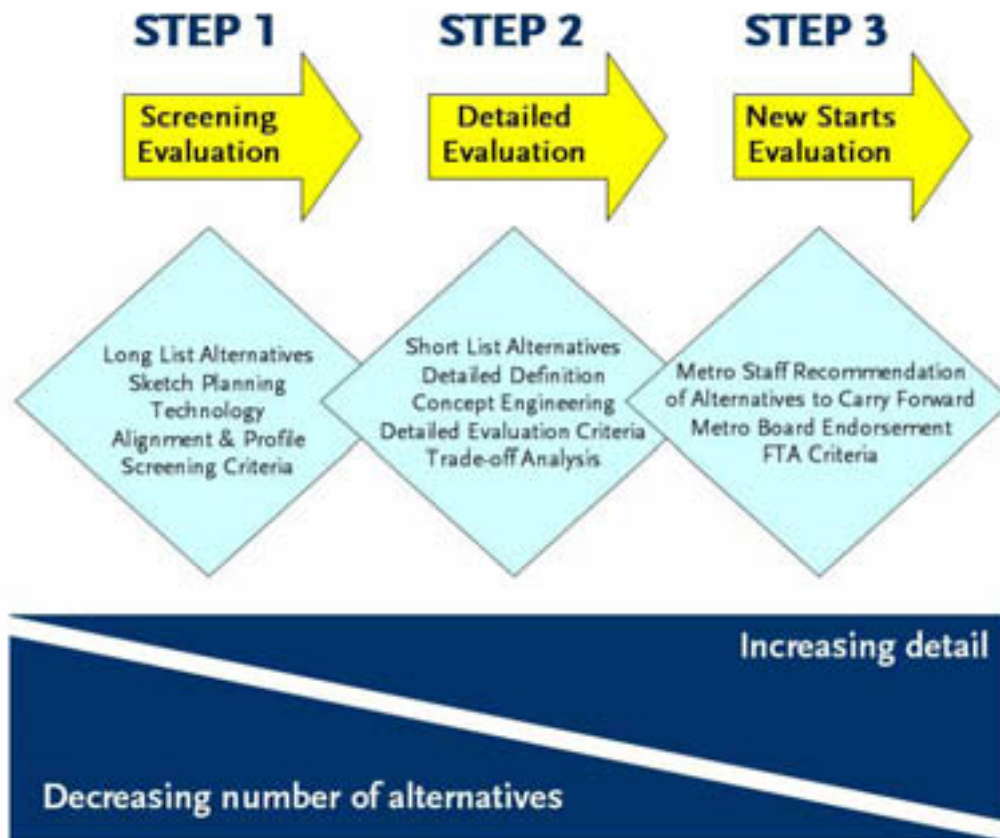
2.9 Screening and Selection Process for the Detailed Alternatives

This section contains an overview of the screening process for the alternatives evaluation plus the performance measures used and their relationship to the prescribed study Goals and Objectives as described in the *Final Analysis Methodology Report (September 7, 2007)*. In addition, this section presents the screening measure results for each of the seven major Goals as reported in the *Final Initial Alternatives Screening Report (December 20, 2007)*.

The universe of alternatives for the Westside Extension Transit Corridor were identified, evaluated, and narrowed to the most promising few in three steps as illustrated in Figure 2-32.

- **Step 1 Screening:** The screening process started with a broad set of alternatives covering a range of alignment and modal alternatives and reduces it to a reasonable set of No Build, TSM, and Build alternatives to carry forward into more detailed definition, travel demand modeling, conceptual engineering and comparative assessment. During the screening step, alternatives were analyzed at a planning level of detail.

Figure 2-32. Evaluation Framework





- Step 2 Detailed Evaluation of Alternatives: The alternatives evaluation step involved a more detailed definition, assessment, and comparison of the shortlist of alternatives emerging from the screening analysis. The detailed evaluation of alternatives was conducted at a conceptual engineering level of analysis, relying on more specific performance measures as well as FTA guidance to support the Metro staff recommendation and Metro Board endorsement.
- Step 3 New Starts Evaluation and Project Recommendation: Final refinement and recommendation, evaluation and documentation of the rationale used to select the project(s), using required templates for submission to FTA.

The first step (screening) involved an evaluation of a large number of possible transit corridors, alignments and modes at a conceptual level. Each of the subsequent steps considered a smaller number of alternatives at a greater level of detail. As the number and range of alternatives narrowed through the course of the study, the level of detail increased. This first step began with 17 alternatives resulting from the Early Scoping process.

The screening analysis focused on answering key questions or concerns that prove to be distinguishers among major choices. Evaluation factors associated with each of these key questions are identified in Section 1.9. Table 2-5 presents some of the key questions, including:

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

Table 2-5. Three Key Issues to Address in Screening Analysis

Vertical Alignment / Degree of Right-of-Way	Transit Mode / Technology	Horizontal Alignment
<ul style="list-style-type: none"> ■ Travel Times ■ Trip Reliability ■ Transit Capacity ■ Safety and Security ■ Right-of-Way Impacts ■ Natural and Cultural Resources ■ Traffic and Circulation ■ Available Right-of-Way sufficient to prevent undue noise and visual impacts on adjacent structures ■ Local Support ■ Community Acceptance ■ Constructability/Construction Impacts ■ Cost-Effectiveness 	<ul style="list-style-type: none"> ■ Transit Capacity ■ System Connectivity ■ Trip Reliability ■ Ridership ■ Cost-Effectiveness ■ Safety and Security ■ Travel Times 	<ul style="list-style-type: none"> ■ Ridership Potential ■ System Connectivity ■ Constructability / Construction Impacts ■ Transit Supportive Land Uses ■ Economic Benefit ■ Local Support ■ Community Acceptance

This ensured that the bulk of the study effort as well as public scrutiny and review were devoted to the most promising alternatives and transportation improvements. In this manner, the various



transportation proposals under consideration continue to evolve as the Westside Extension Transit Corridor Study progresses. The alternatives not carried forward at the conclusion of each step were carefully documented in terms of the reasons for why they were not considered further.

In concert with these three key issues, 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. As discussed in Chapter 1, seven goals and their corresponding objectives were identified. The Initial Alternatives Screening report discusses, in depth, the analysis related to each of these goals and objectives. The results are discussed briefly below.

- **Mobility Improvement**
 - ▶ Reduce transit travel times
 - ▶ Improve trip reliability
 - ▶ Provide sufficient transit capacity to meet transit demand in 2030 and beyond (expandability)
 - ▶ Maximize potential transit ridership
 - ▶ Enhance linkages to the transportation system as well as to major trip attractors/generators within the corridor
- **Transit Supportive Land Use Policies and Conditions**
 - ▶ Provide transit service to areas with transit-supportive land uses and policies
 - ▶ Integrate with local redevelopment plans and policies
- **Cost-Effectiveness**
 - ▶ Provide solutions with benefits commensurate with their costs
- **Project Feasibility**
 - ▶ Provide transportation solutions that are financially feasible
 - ▶ Minimize risk associated with project construction
- **Equity**
 - ▶ Improve transit services available to transit dependent communities
 - ▶ Provide solutions that distribute both economic and environmental costs and benefits fairly across different population groups
- **Environmental Considerations**
 - ▶ Minimize the displacement of homes and businesses.
 - ▶ Minimize impacts to the traffic and circulation system.
 - ▶ Minimize impacts to the character of the community.
 - ▶ Provide for the safety and security of pedestrians and transit users.
 - ▶ Minimize impacts on sensitive and protected environmental resources.
 - ▶ Reduce, not add to, tailpipe emissions / non-renewable fuel consumption.



■ Public Acceptance

- ▶ Develop public support of private and public stakeholders;
- ▶ Attain support of elected officials representing participating jurisdictions;
- ▶ Develop solutions which enhance and are sensitive to quality of life issues for communities in the study area

Performance measures were identified to measure the achievement of the goals and objectives according to a set of evaluation criteria as documented in the *Final Analysis Methodology Report (September 7, 2007)*. The screening results by Goal and Objective within each Goal using the specific evaluation criteria and performance measures are available in full in the *Final Initial Alternatives Screening Report (December 20, 2007)*.

The results are touched upon in Section 2.10.

2.10 Alternatives Dropped from Further Consideration

Following technical analysis, public input, and data analysis, five Build alternatives in addition to the No Build and TSM alternatives were identified for further study. As shown in Table 2-6, 13 alternatives were dropped from consideration based upon a number of factors, including transit modes, alignment issues, and alternative specific issues. These factors, including why each alternative was dropped, are discussed below.

Table 2-6. Alternatives Dropped from Further Consideration

Alternatives Dropped	Screened List of Alternatives
2	No Build
3	TSM
4	1
5	11
6	14
7	16
7a	17
8	
9	
10	
12	
13	
15	

2.10.1 Transit Modes

Travel demand identified in the ridership analysis justifies selection of the highest capacity system. Systems must be sized for the high capacity peak period loading along the Wilshire and Santa

Monica alignments. The detailed ridership capacity analysis can be found in the *Final Initial Alternatives Screening Report (December 20, 2007)*.

LRT, monorail, and BRT technologies provide less capacity than HRT, and cannot accommodate the forecasted demand. Figure 2-33 illustrates the operating characteristics of these modes. This figure assumes a common number of vehicles or trains per hour. The ridership analysis consistently demonstrated a need for a mode that could provide a capacity of more than 700 passengers per train set.

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 along the existing or proposed alignment. 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 in that a higher number of trains could operate on the Santa Monica Boulevard alignment. As described previously, HRT is the highest capacity system of those studied, and has most potential for future capacity expansion.





LRT

With three existing systems in operation in Los Angeles, LRT is a familiar technology. However, with several 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 elevated LRT on Wilshire Boulevard.

Because this technology differs from the HRT currently terminating at the Wilshire/Western Metro Purple Line station, a transfer is needed at this location, which may impact 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.



Figure 2-33. Carrying Capacity by Mode

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) To Speed of 35 mph (13-22 mph average) Up to 1,800 passengers/hour/direction	Metro Orange Line Wilshire Metro Rapid

Monorail

While new to the Los Angeles region, monorails are in operation in Las Vegas and overseas. This completely new technology requires the construction of a dedicated maintenance facility (estimated to be approximately 15 acres in size) on the Westside. The unfamiliar technology would require additional training and less cross-utilization of Metro train operators.

Because this technology differs from the HRT currently terminating at the Wilshire/Western Metro Purple Line station, a transfer is needed at this location, which may impact 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 is not on an exclusive right-of-way. Therefore, the ridership and travel time savings are lower than the rail alternatives.

Because this technology differs from the HRT currently terminating at the Wilshire/Western Metro Purple Line station, a transfer is needed at this location, which may impact 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, as well as limiting the number of transfers. BRT was selected for further study due to its comparatively lower cost.

2.10.2 Transit Alignments**2.10.2.1 Vertical Alignment Issues****Elevated Alignments**

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

- Column placement would require the removal of 2-3 traffic lanes. This results in major traffic impacts and runs counter to the project objective to add capacity to the corridor.
- In order to mitigate the traffic impacts associated with the removal of 2-3 traffic lanes, 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 impacted.
- Land use impacts are high in station areas (for stations and ancillary operations structures) and for traffic mitigation.
- There are visual, noise & 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 US systems as guidance. Typical cross sections of elevated LRT and HRT systems are shown in Figure 2-34 and Figure 2-35. A typical cross section of an elevated monorail platform and station area is shown in Figure 2-36.

Figure 2-34. Typical Cross Section: Elevated LRT

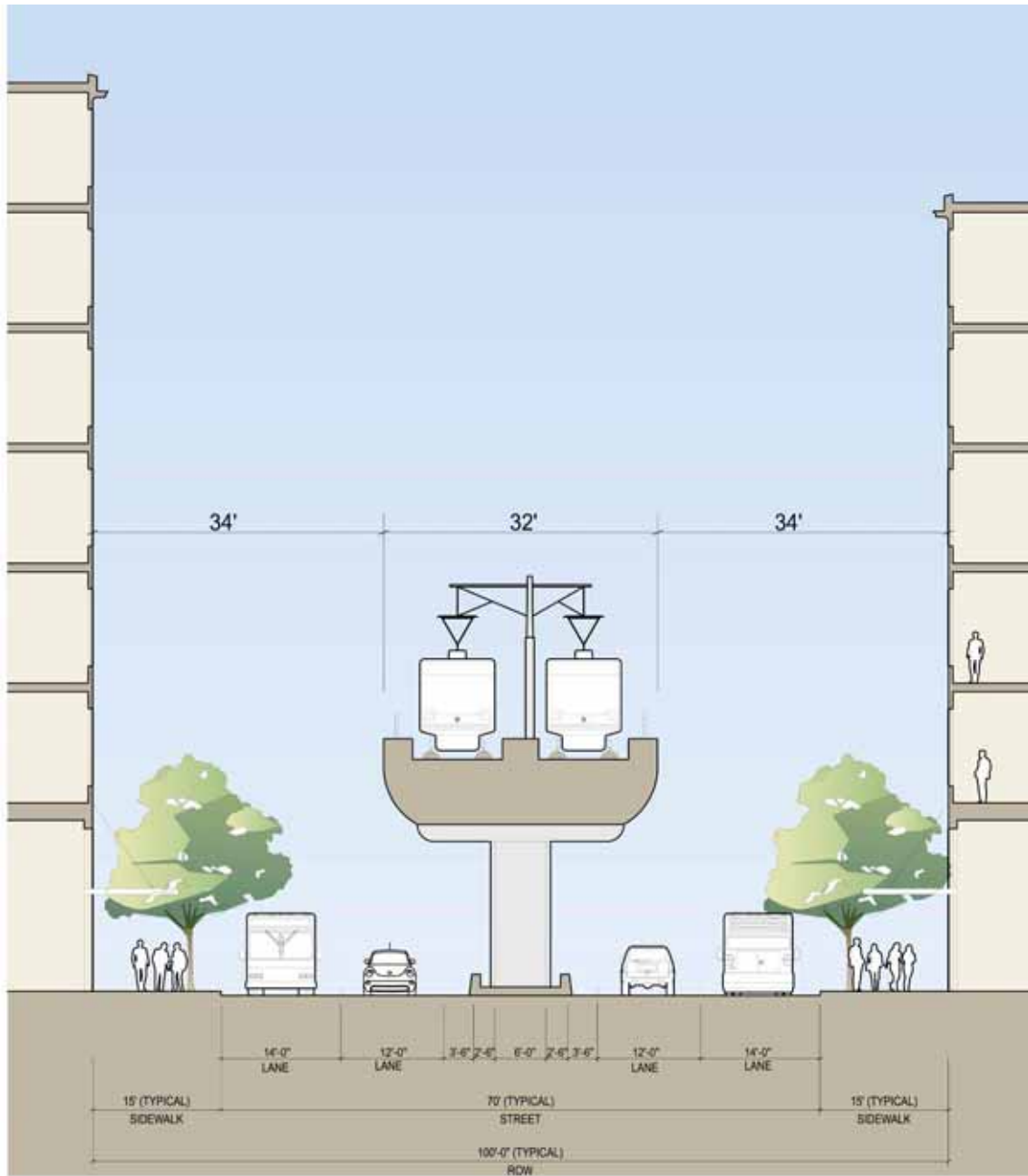




Figure 2-35. Typical Cross Section: Elevated HRT

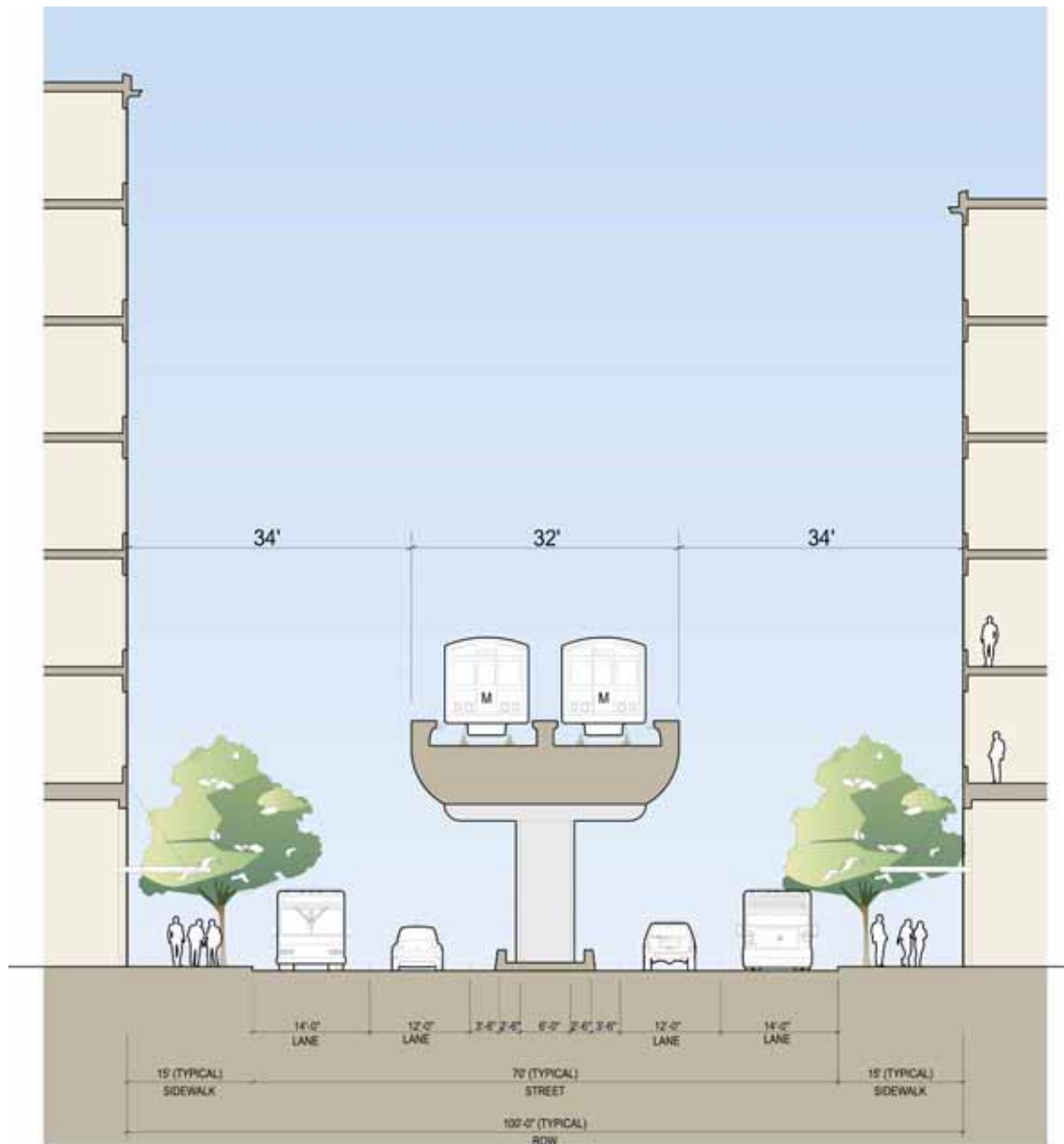
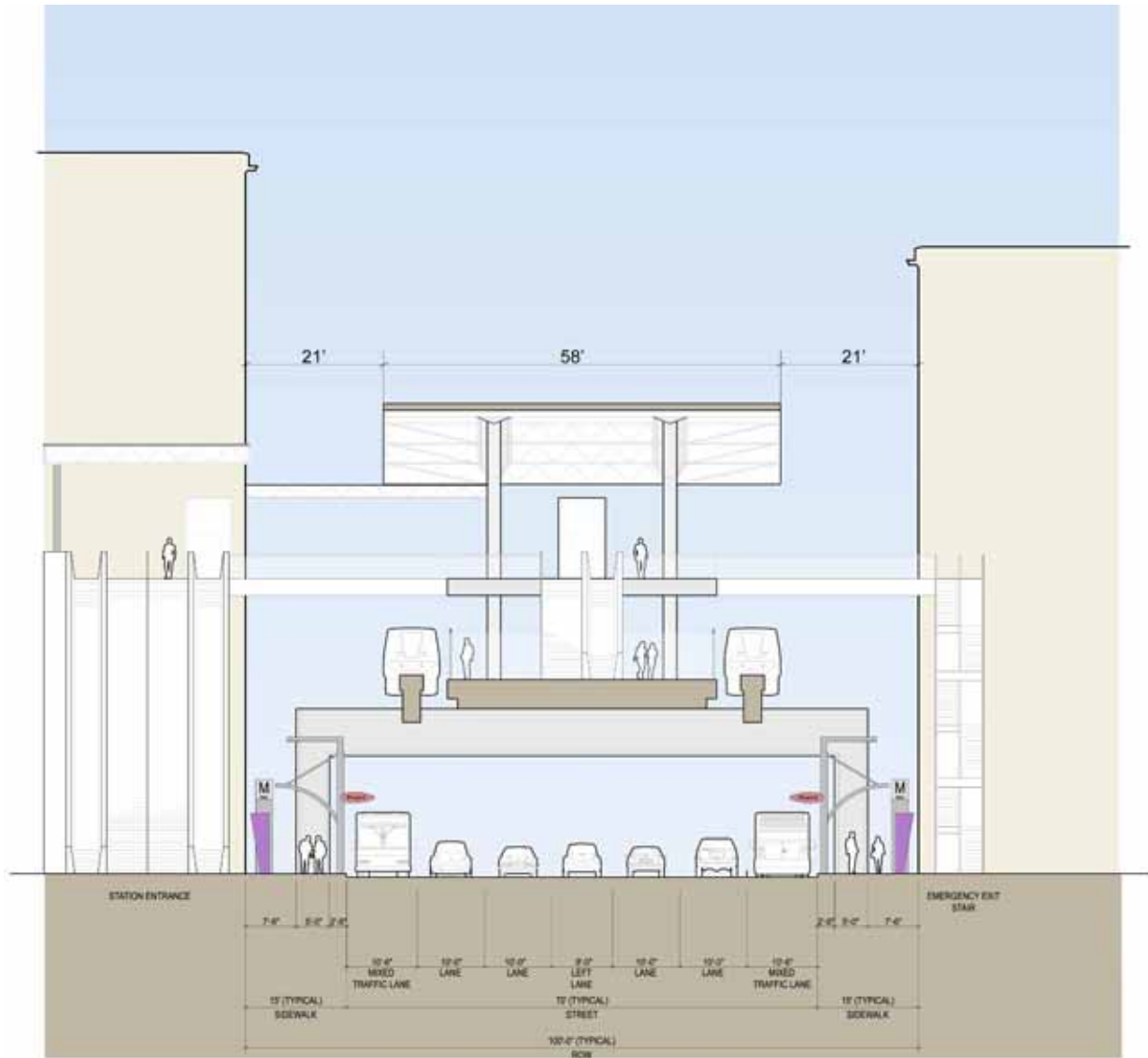


Figure 2-36. Typical Cross Section: Monorail Station Platform



Cities that have fully aerial systems or systems with aerial segments include Los Angeles (the western portion of the Metro Green Line LRT and the Chinatown portion of the Metro Gold Line LRT), Las Vegas (fully aerial Monorail system), and the San Francisco Bay Area (portions of the BART HRT system). The aerial LRT segments in Los Angeles are located in medium density commercial areas. The aerial Monorail system in Las Vegas is located approximately one block off the “Strip,” maintaining a separation between pedestrian environments and the elevated structure. Land use adjacent to the Las Vegas Monorail is commercial/industrial. Aerial portions of BART are primarily located in the East Bay and south of downtown San Francisco along freeway corridors.

Analysis of the aerial portions of these systems does not recommend their use in the dense, highly urban corridors such as Wilshire or Santa Monica Boulevards. A photo simulation, shown in Figure 2-37, illustrates a potential elevated monorail station at the densely developed intersection of Wilshire Boulevard and Fairfax Avenue.

Figure 2-37. Wilshire/Fairfax Elevated Station Photo Simulation



Subway Alignments

- In suburban and low density urban areas, subway alignments are 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).



- 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 tunneling occasionally occurs under private property.

Summary

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

2.10.2.2 Horizontal Alignment Issues

Santa Monica Boulevard Alignments

- Stand alone Santa Monica Boulevard subway alternatives (Alternatives 4, 6, 7, 7a, 8, and 13) do 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, and it avoids most of the tunneling under sensitive and historic residential areas. 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 offsets relatively high costs resulting in an overall good cost-effectiveness performance. High costs may require phased development of this alternative due to 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. These centers are within approximately ½ mile of Wilshire Boulevard.
- Alternative 12 does not serve major activity centers, including the Los Angeles County Museum of Art (LACMA) and Farmer’s Market/The Grove, and misses the preferred City of Beverly Hills station located at the intersection of Wilshire Boulevard and Beverly Drive.
- Alternative 14 requires reconfiguration due to an 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

- High ridership and travel time savings offsets relatively high costs resulting in an overall good cost-effectiveness performance. High costs may require phased development of a combination alternative due to 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 need to serve 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 the major activity centers of LACMA and Farmer’s Market/The Grove, and require slightly more tunneling under residential areas.
- Alternatives 15 and 16 require reconfiguration due to an 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

Westwood Homeowners have requested that additional alignments be considered between Century City and Westwood. This affects all HRT subway alignments.

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.

2.10.3 Alternative-Specific Issues

This section identifies specific issues discussed in the previous sections, which led to the elimination of each dropped alternative.

Alternative 2: Wilshire Boulevard Alignment HRT Elevated

This alternative was dropped from consideration based on the following:

- Elevated alternatives have substantive environmental and land use impacts.
- This alternative has good ridership but is not as cost-effective because of the potential for extensive land acquisition.



Alternative 3: Wilshire Boulevard Alignment LRT/Monorail Elevated

This alternative was dropped from consideration based on the following:

- Elevated alternatives have substantive environmental and land use impacts.
- LRT/Monorail alternatives lack required capacity and expansion capability.

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

This alternative was dropped from consideration based on the following:

- Direct connections at the Universal City and Hollywood/Highland stations create branching of HRT lines and may negatively impact train operations throughout the system.
- Santa Monica Boulevard stand alone alignments have lower ridership and are less cost-effective.

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

This alternative was dropped from consideration based on the following:

- Elevated alternatives have substantive environmental and land use impacts.
- LRT/Monorail alternatives lack required capacity and expansion capabilities.
- Santa Monica Boulevard stand alone alignments have lower ridership and are less cost-effective.

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

This alternative was dropped from consideration based on the following:

- A direct connection at the Hollywood/Highland station creates branching of HRT lines and may negatively impact train operations throughout the system.
- Santa Monica Boulevard stand alone alignments have lower ridership and are less cost-effective.

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

This alternative was dropped from consideration based on the following:

- A direct connection at the Hollywood/Highland station creates branching of HRT lines and may negatively impact train operations throughout the system.
- Santa Monica Boulevard stand alone alignments have lower ridership and are less cost-effective.



Alternative 7a: Santa Monica Boulevard Alignment HRT Subway with Hollywood/Highland Red Line Connection/Galaxy South

This alternative was dropped from consideration based on the following:

- A direct connection at the Hollywood/Highland station creates branching of HRT lines and may negatively impact train operations throughout the system.
- Santa Monica Boulevard stand alone alignments have lower ridership and are less cost-effective.

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

This alternative was dropped from consideration based on the following:

- A direct connection at the Hollywood/Vine station creates branching of HRT lines and may negatively impact train operations throughout the system.
- Santa Monica Boulevard stand alone alignments have lower ridership and are less cost-effective.

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

This alternative was dropped from consideration based on the following:

- Direct connections at the Universal City and Hollywood/Highland stations create branching of HRT lines and may negatively impact train operations throughout the system.
- This alternative has good ridership but is not as cost-effective as other combined alternatives.

Alternative 10: Wilshire/Santa Monica Boulevards Combined HRT Subway (Alt. 1 + Alt. 7)

This alternative was dropped from consideration based on the following:

- A direct connection at the Hollywood/Highland station creates branching of HRT lines and may negatively impact train operations throughout the system.
- The Santa Monica Boulevard portion of this alternative travels through a lower density part of Beverly Hills, resulting in lower ridership than other combined alternatives.

Alternative 12: Wilshire/Beverly Boulevards Centers HRT Subway

This alternative was dropped from consideration based on the following:

- Key elements from this alignment (specifically an adaptation of the routing off Wilshire to serve the Grove/Farmer's Market and Cedars Sinai) are part of the modified Alternative 14, which was deemed to be a better alternative to carry forward for further study.



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

This alternative was dropped from consideration based on the following:

- A direct connection at the Hollywood/Highland station creates branching of HRT lines and may negatively impact train operations throughout the system.
- Santa Monica Boulevard stand alone alignments have lower ridership and are less cost-effective.

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

This alternative was dropped from consideration based on the following:

- A direct connection at the Hollywood/Highland station creates branching of HRT lines and may negatively impact train operations throughout the system.
- Key elements from this alignment (specifically an adaptation of the routing off Wilshire to serve the Grove/Farmer’s Market, Beverly Center and Cedars Sinai) are part of the modified Alternative 16, which was deemed to be a better alternative to carry forward for further study.

Table 2-7. 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
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
12*						
13	X				X	X
15*	X					

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



2.11 Definition of the Detailed Alternatives Evaluated in this Alternatives Analysis

2.11.1 Use of FTA Project Justification Criteria

The Westside Extension Corridor Study is the first step in a multi-step process to implement a major transit improvement for this part of the Los Angeles region. This first step, also known as Alternatives Analysis, is being conducted following strict guidelines established by the FTA. The basic steps being followed include:

- Alternatives Analysis
- EIS/EIR and Preliminary Engineering
- Final Engineering
- Construction
- Revenue Service

The successful completion of the Westside AA will allow Metro to evaluate a range of alternative transit improvements for the Westside Extension Transit Corridor and to select a Locally Preferred Alternative (LPA) that can best accommodate population growth and transit demand and be compatible with land use and future development opportunities.

2.11.2 No Build

As stated in Section 2.8.1, 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' 2004 RTP. There were no changes made to the No Build Alternative as originally defined.

Proposed major highway improvements impacting the Westside Transit corridor between now and 2030 only include the addition of a new HOV lane on I-405 Freeway between US 101 and I-105 Freeway.

From a rail transit perspective, the Westside study area will continue to be served by the Purple and Red Metro Rail Lines along the eastern and northeastern edges of the study area. Additional rail service committed in 2030 (2001 Metro Long Range Transportation Plan, Baseline) includes:

- Metro Gold Line Eastside Extension: from Union Station to East LA;
- Exposition LRT Line: from 7th/Metro to Culver City; and
- LAX People Mover: from the Aviation/LAX station of the 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. Of particular note are the Metro Rapid bus route additions and modifications for:

- Santa Monica Boulevard Metro Rapid Bus (Line 704)
- Culver City Bus Rapid 6 (operated by Culver City Bus)



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

These routes will offer an increased quality of service by 2030 for purposes of alternative comparison. Refer to Figure 2-38.

2.11.3 TSM

As defined in Section 2.8.2, the 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. 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. Refer to Figure 2-39.

A number of local Metro bus routes will see peak period frequency enhancements over the No Build Alternative. These routes include:

- Sunset Boulevard (short line (SL) Westwood) (Line 2)
- Santa Monica Boulevard SL (Line 4)
- Beverly Boulevard SL (Line 14)
- West Third Street Limited (Line 16)
- Wilshire Boulevard-Westwood (Line 20)
- Vermont Avenue SL (Line 204)
- Western Avenue SL (Line 207)

Figure 2-38. No Build Alternative



Figure 2-39. TSM Alternative





In addition to the local bus routes described above, a series of Metro Rapid Bus routes will also be enhanced as part of the TSM Alternative. These routes include:

- Santa Monica Boulevard Metro Rapid Bus (Line 704)
- Olympic Boulevard Metro Rapid Bus (Line 728)
- Vermont Avenue Metro Rapid Bus (Line 754)

2.11.4 Heavy Rail Alternatives

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

Attributes common to all HRT alternatives

- All alternatives have a portal section between Wilshire/Crenshaw and the Wilshire/Western Metro Purple Line Station to accommodate a possible Crenshaw at-grade alignment.
- Based on comments received from the public, the Wilshire/Crenshaw station will be optional and studied further.
- Several underground alignment options between Wilshire/Beverly and Wilshire/Westwood stations remain for further study.

Alternative 1 – Wilshire Boulevard Alignment HRT Subway

- This alternative 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. Refer to Figure 2-40.
- Stations include:
 - ▶ Wilshire/Crenshaw (optional)
 - ▶ Wilshire/La Brea
 - ▶ Wilshire/Fairfax
 - ▶ Wilshire/La Cienega
 - ▶ Wilshire/Beverly
 - ▶ Century City
 - ▶ Westwood/UCLA
 - ▶ Wilshire/Bundy
 - ▶ Wilshire/26th
 - ▶ Wilshire/16th
 - ▶ Wilshire/4th
- The alignment is generally under Wilshire Boulevard with a direct connection at the Wilshire/Western Station.

Figure 2-40. Alternative 1 - Wilshire Boulevard Alignment HRT Subway





Alternative 11 – Wilshire/Santa Monica Boulevards Combined HRT Subway

- This alternative extends 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 underground with stations, and 1 optional station. Refer to Figure 2-41.
- 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.
- Stations Include:
 - ▶ Wilshire/Crenshaw (optional) Wilshire/26th
 - ▶ Wilshire/La Brea Wilshire/16th
 - ▶ Wilshire/Fairfax Wilshire/4th
 - ▶ Wilshire/La Cienega Hollywood/Highland (transfer)
 - ▶ Wilshire/Beverly Santa Monica/La Brea
 - ▶ Century City Santa Monica/Fairfax
 - ▶ Westwood/UCLA Santa Monica/La Cienega or San Vicente
 - ▶ Wilshire/Bundy Beverly Center Area
- There are two alignment options in the West Hollywood/Beverly Center area:
 - ▶ Option 11A follows San Vicente from Santa Monica Boulevard down to La Cienega Boulevard, where it curves south and then west to meet the Wilshire Boulevard alignment. Stations in this area would include Santa Monica/San Vicente and a Beverly Center/Cedars Sinai area station. An optional station at Wilshire/Robertson would replace a station at Wilshire/La Cienga. Refer to Figure 2-42.
 - ▶ Option 11B follows La Cienega from Santa Monica Boulevard south, past the Beverly Center, and curves west at Wilshire Boulevard. Stations include Santa Monica/Fairfax and a Beverly Center/Cedars Sinai area station. An optional station at Wilshire/Robertson would replace a station at Wilshire/La Cienga. Refer to Figure 2-43.

Alternative 14 – Wilshire Boulevard/Fairfax Centers HRT Subway

- This alternative extends from the Metro Purple Line Wilshire/Western Station to 4th Street and Wilshire Boulevard in Santa Monica underground with 11 stations, and 2 optional stations. Refer to Figure 2-44.
- Stations include:
 - ▶ Wilshire/Crenshaw (optional)
 - ▶ Wilshire/La Brea
 - ▶ Wilshire/Fairfax
 - ▶ Wilshire/Fairfax/3rd Street
 - ▶ Beverly Center Area
 - ▶ Wilshire/Robertson (optional)
 - ▶ Wilshire/Beverly

Figure 2-41. Alternative 11 - Wilshire/Santa Monica Boulevards Combined HRT Subway



Figure 2-42. Alternative 11A - Wilshire/Santa Monica Boulevards Combined HRT Subway



Figure 2-43. Alternative 11B - Wilshire/Santa Monica Boulevards Combined HRT Subway

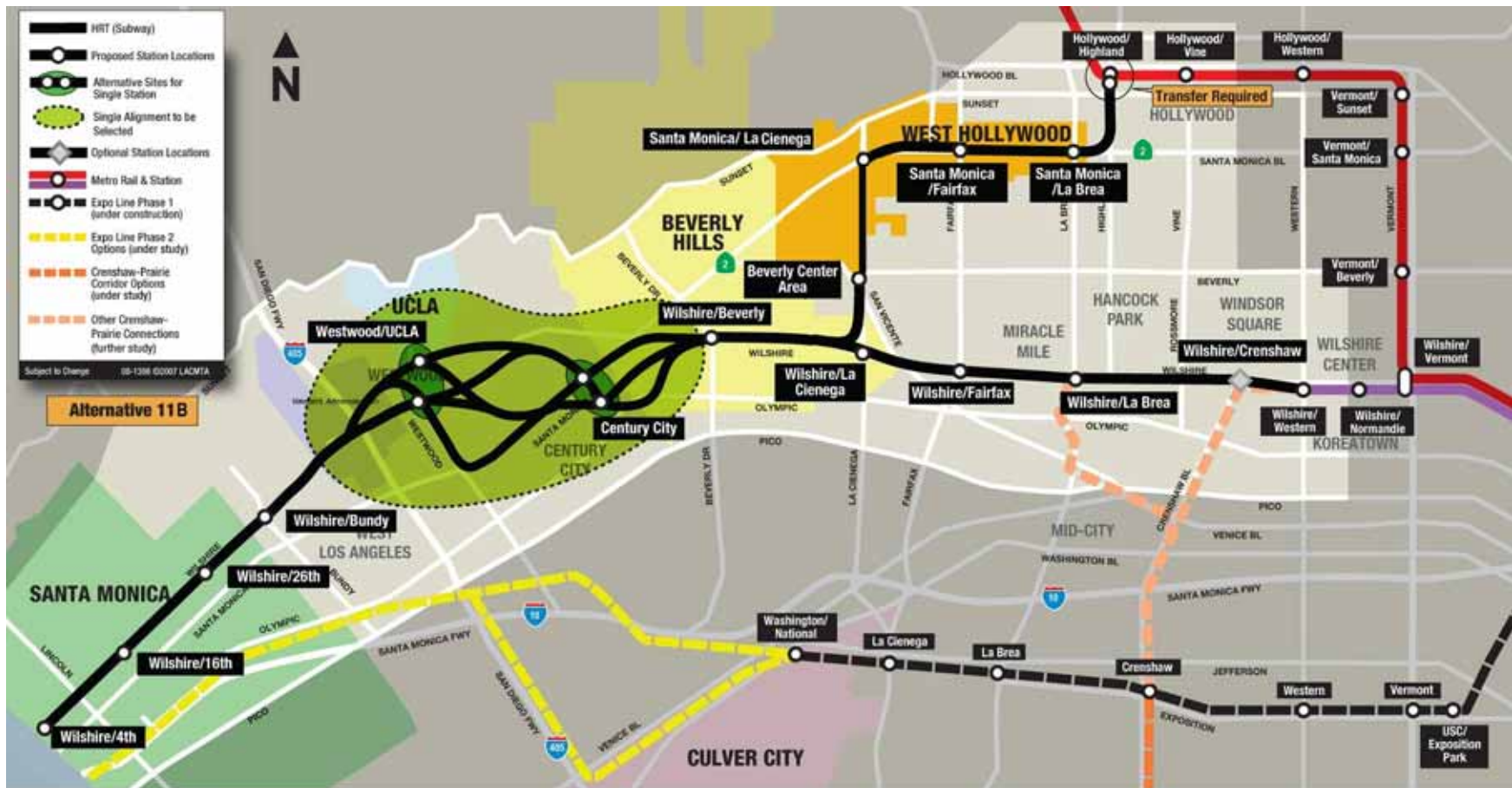


Figure 2-44. Alternative 14 - Wilshire Boulevard/Fairfax Centers HRT Subway





- ▶ Century City
- ▶ Westwood/UCLA
- ▶ Wilshire/Bundy
- ▶ Wilshire/26th
- ▶ Wilshire/16th
- ▶ Wilshire/4th
- This alignment is generally under Wilshire Boulevard to Fairfax Avenue, continues under Fairfax Avenue to Beverly Boulevard, then west 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.

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

- This alternative extends 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 underground with 15 stations, and 2 optional stations, including a transfer at the Hollywood/Highland Station. Refer to Figure 2-45.
- Stations include:

▶ Wilshire/Crenshaw (optional)	Wilshire/Bundy
▶ Wilshire/La Brea	Wilshire/26 th
▶ Wilshire/Fairfax	Wilshire/16 th
▶ Fairfax/3 rd Street	Wilshire/4 th
▶ Beverly Center Area	Hollywood/Highland (transfer)
▶ Wilshire/Robertson (optional)	Santa Monica/La Brea
▶ Wilshire/Beverly	Santa Monica/Fairfax
▶ Century City	Santa Monica/La Cienega
▶ Westwood/UCLA	
- The Santa Monica Boulevard portion of the alignment transitions south under La Cienega, past the Beverly Center, and 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, then turns north under Fairfax Avenue to Beverly Boulevard, heads west under Beverly Boulevard to La Cienega Boulevard, where it turns south under La Cienega Boulevard. The alignment then transitions west again on Wilshire Boulevard to Santa Monica Boulevard, which it follows through Century City. After Century City, the alignment veers north again to rejoin Wilshire Boulevard, which it follows west to 4th Street in Santa Monica.

Figure 2-45. Alternative 16 - Wilshire/Santa Monica Boulevards Combined Centers
 HRT Subway with transfer at Hollywood/Highland





- 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.

2.11.5 Bus Rapid Transit Alternative

As described in Section 2.8.5, the BRT alternative consists of a specially operated dedicated peak period curb lane 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 Westwood Boulevard with nine 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.

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 providing service to downtown Santa Monica on both Wilshire and Santa Monica Boulevards. Refer to Figure 2-46.
- 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 Monica Boulevard to the intersection of Westwood and Wilshire Boulevards (Line 3), as a branch of Line 2.
- Line 1 has 15 stops, Line 2 has 13 stops and Line 3 has nine stops.

Figure 2-46. Alternative 17 - Wilshire/Santa Monica Boulevards BRT At Grade



WESTSIDE EXTENSION TRANSIT CORRIDOR STUDY