



WESTSIDE SUBWAY EXTENSION

Transportation Impacts Report



August 2010



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Acronyms and Abbreviations

AA	Alternatives Analysis
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act (PRC 21000-21177)
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information System
HRT	heavy rail transit
ICSC	International Council of Shopping Centers
LOS	level of service
LPA	Locally Preferred Alternative
LRTP	Long Range Transportation Plan
LUCE	City of Santa Monica Land Use and Circulation Element
Metro	Los Angeles County Metropolitan Transportation Authority
MOS	minimum operable segment
NEPA	National Environmental Policy Act (42 USC 4321-4347)
RPP	Residential Permit Parking
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SF	square footage
TAZ	Traffic Analysis Zone
TSM	Transportation System Management
UCLA	University of California, Los Angeles
ULI	Urban Land Institute
VA	Veterans Administration
VHD	vehicle hours of delay
VHT	vehicle hours traveled
VMT	vehicle miles traveled



1.0 EXECUTIVE SUMMARY

Los Angeles is among the world's most desirable places to live and work, and its population and jobs are expected to grow for the foreseeable future. This is especially true on the west side of Los Angeles County, which includes the City of Santa Monica, the City of West Hollywood, and the City of Beverly Hills, as well as major centers like UCLA and Century City. With this growth, travel on the west side of Los Angeles will continue to increase, contributing to what is already the worst traffic congestion in the United States.¹

Local jurisdictions are not planning any major roadway expansion projects through 2035. Because of the level of buildout and density in the Study Area, local jurisdictions have generally determined through their policies that congestion relief improvements should focus on travel demand management along with increased ride sharing and transit usage rather than highway/arterial physical improvements, such as road widening or new roadways. In a number of cases, local communities that desire to eliminate cut-through and neighborhood traffic to support more livable downtown or commercial areas are supporting initiatives to limit roadway capacity or to slow traffic flow, leaving transit improvements as the only viable alternative to reduce traffic volumes and congestion-related delays.

In the cities on the Westside, policy-makers have taken strong positions against the wholesale widening of streets and narrowing of sidewalks to accommodate more travel lanes. Localized Transportation System Management (TSM) improvements, such as additional turn lanes or signal phasing changes, have been supported, but the arterial network in the Westside is essentially built out. In this highly urbanized area, the types of transportation improvements that have the support of the policy makers include intelligent transportation systems projects and livable communities programs. Future increases in travel demand will have to be accommodated by making the existing highway network work better where possible in conjunction with increased usage of transit and other (i.e., non-motorized) modes of transportation.

The Westside Subway Extension provides an alternate vision. By fulfilling a long planned increase in exclusive right-of-way transit capacity, the Westside Subway Extension would help to relieve traffic congestion and improve regional access and mobility.

This report analyses how transit, pedestrians, bicycles, traffic, and parking may be impacted by the Westside Subway Extension. Existing transportation conditions are used as a baseline, future conditions are predicted, and the difference between future conditions without the project and future conditions with the project is evaluated according to defined impact criteria. Impacts resulting from construction of the project are also analyzed. Where impacts are expected, mitigation measures are recommended to reduce impacts below their thresholds of significance.

This report documents the transportation impact analysis and findings for the entire Westside Subway Extension Study Area (shown in Figure 1-1), as well as relevant results at the regional scale. However, this summary focuses on areas within a half-mile walking distance of the proposed stations (also shown in Figure 1-1), since the most significant surface transportation changes related to the operation of the subway occur within this area.

¹ Texas Transportation Institute. The 2009 Urban Mobility Report, Table 1.



Station locations are also where the proposed subway will directly interface with the transportation system. Station locations are areas where pedestrians, bicyclists, transit riders, drivers, and people looking for parking would be most directly affected by the Westside Subway Extension.

1.1 Station Area Maps

Figure 1-2 through Figure 1-23 depict each proposed station location and its surrounding transportation facilities. Pedestrian walksheds of one-quarter mile and one-half mile from the station are shaded in red and orange. Half-mile walksheds have been shown to approximate the typical maximum distance that people are willing to walk to utilize public transit. Existing bikeways are depicted with solid lines and proposed bikeways are shown as dotted lines. Metro buses are differentiated by type and non-Metro buses are consolidated into a single color to improve readability. Unrestricted parking, which provides the basis for analyzing spillover parking, is shaded green within one-half mile of stations. Future Year (2035) levels of service for the operation of traffic intersections during AM and PM peak hours are shown at nearby study intersections; level of service for Alternative 5 is used because this is the only scenario that addresses every station and would show the full traffic-reducing benefits of the full build Westside Subway Extension alternative. A range of daily station boardings for the Build Alternatives is shown in the upper right corner.

Each map also includes a station area detail map that shows whether adjacent intersections are signalized or stop-controlled, where crosswalks and bus stops are located, and how pedestrians are expected to flow from station entrances. This detail is shown below the primary station-area map.

These maps provide a synthesis of the transportation facilities and modes that are reviewed in this report. Without drawing conclusions, the maps illustrate the multifaceted role of the proposed subway within the Los Angeles County transportation system. They also suggest the complex nature of the effects that the subway will have on its surrounding environment.

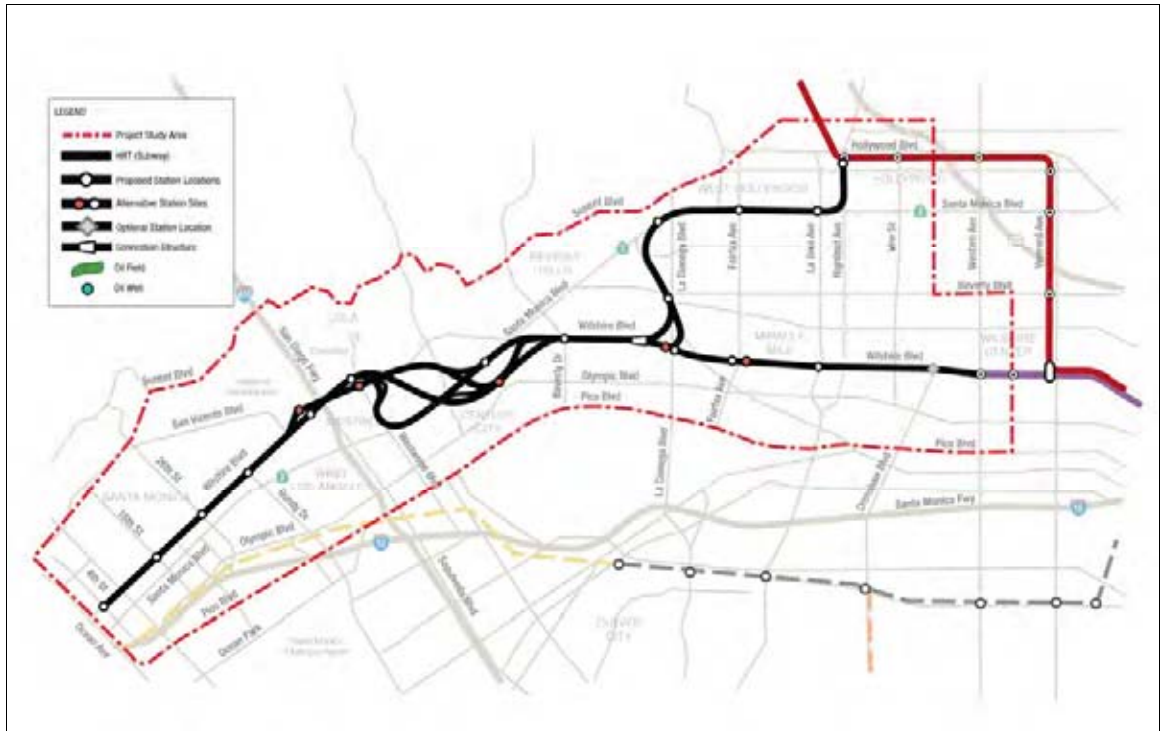


Figure 1-1. Westside Subway Extension Study Area and Proposed Station Locations

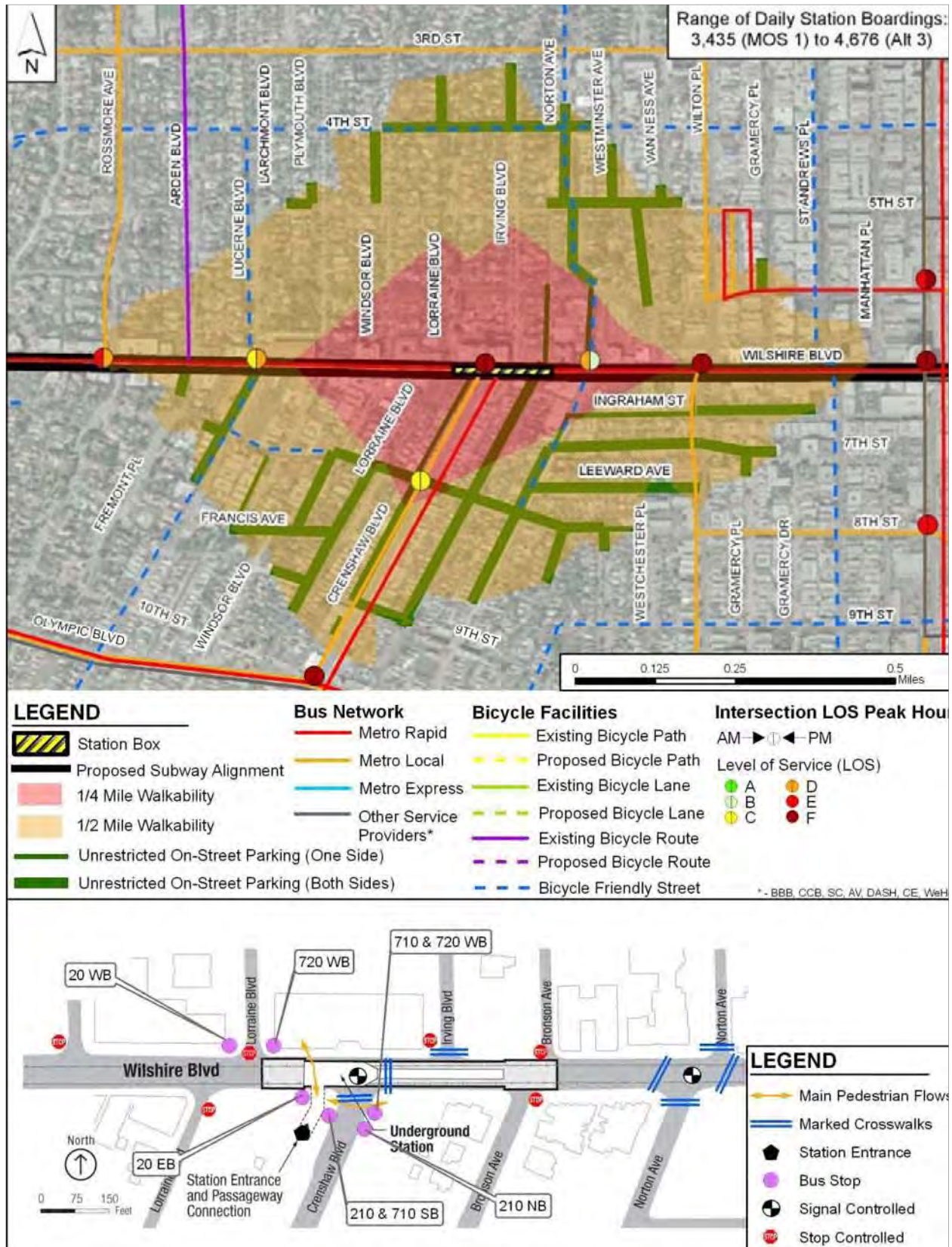


Figure 1-2. Wilshire/Crenshaw Station

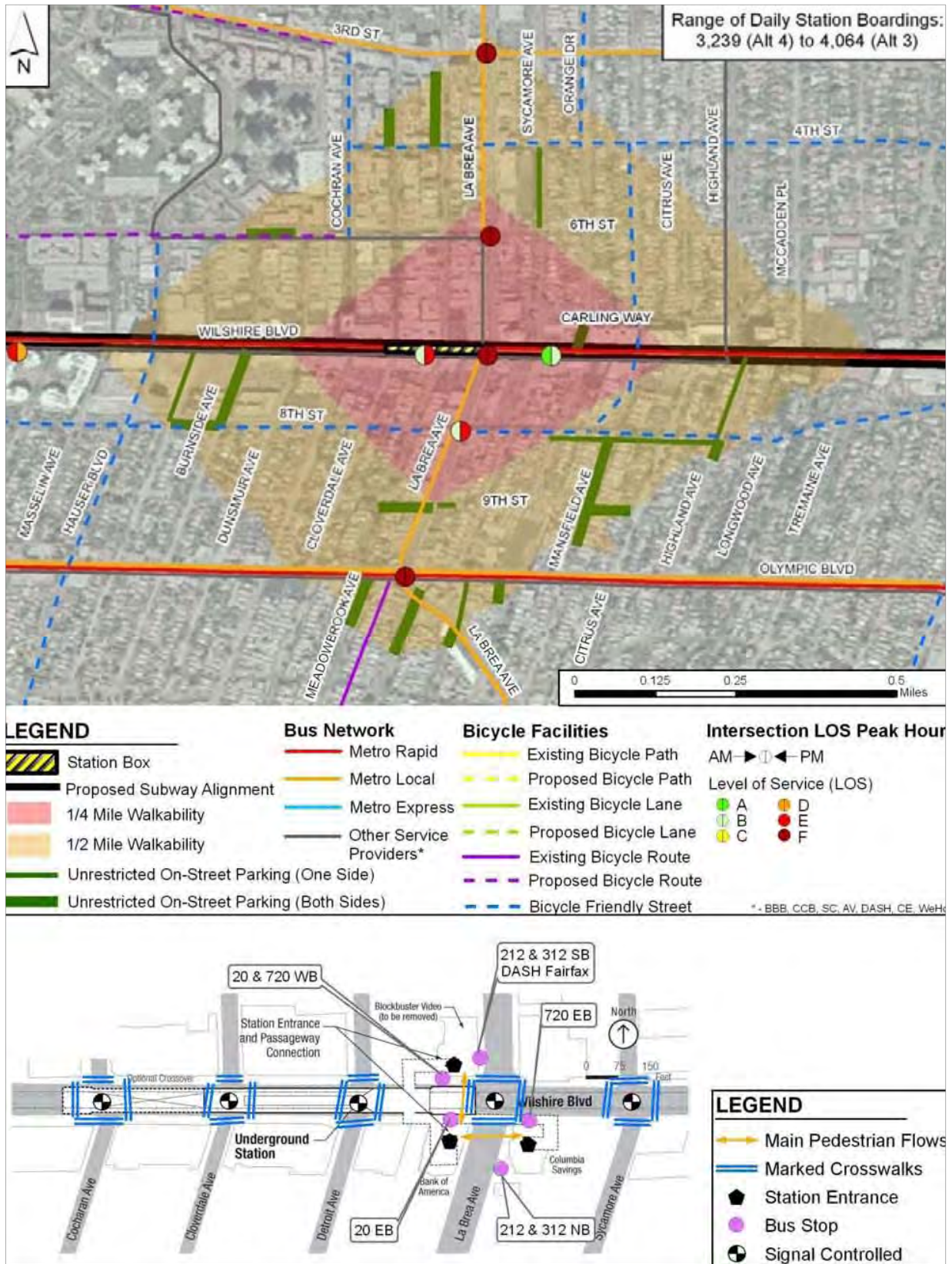


Figure 1-3. Wilshire/La Brea Station

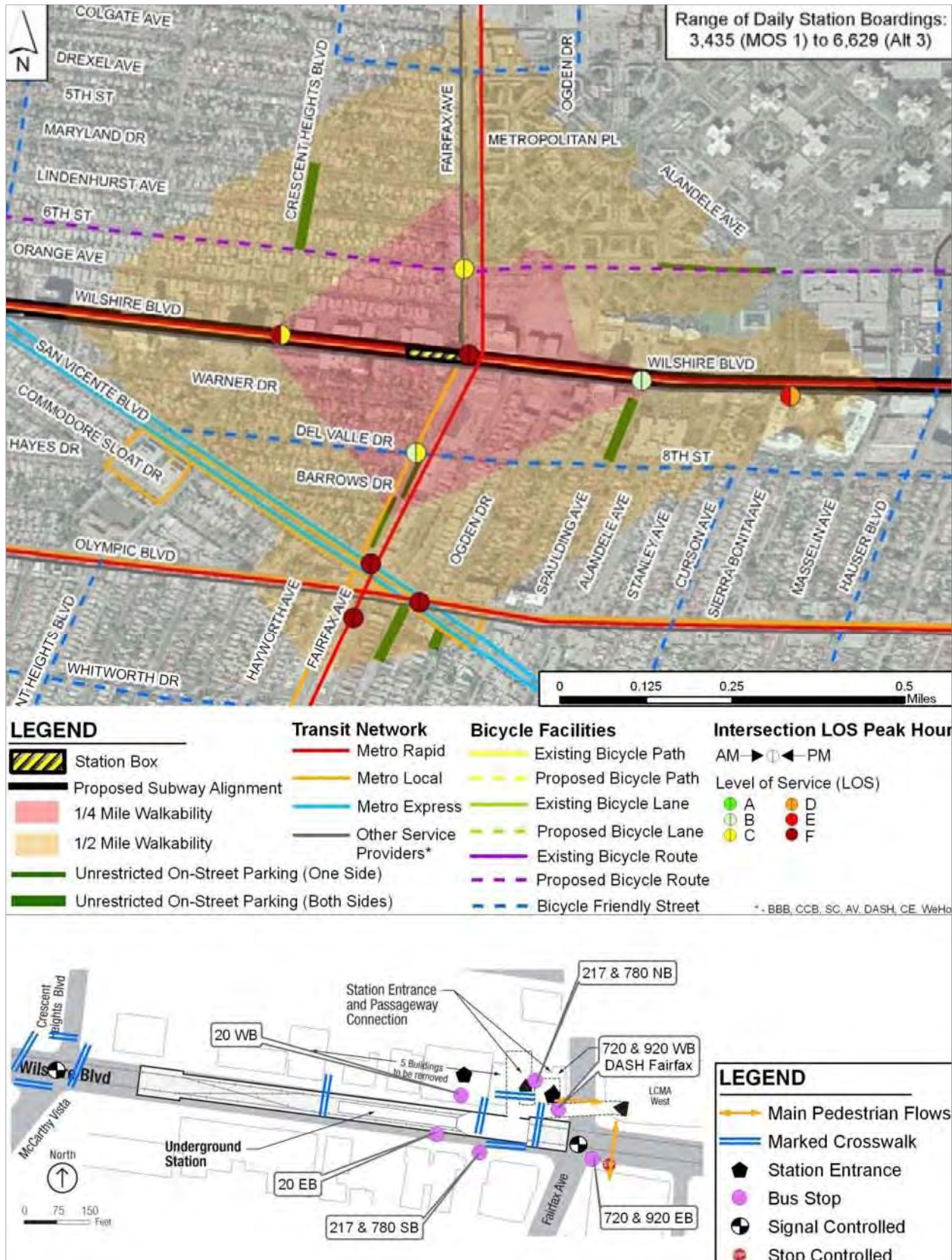


Figure 1-4. Wilshire/Fairfax Station

WESTSIDE SUBWAY EXTENSION

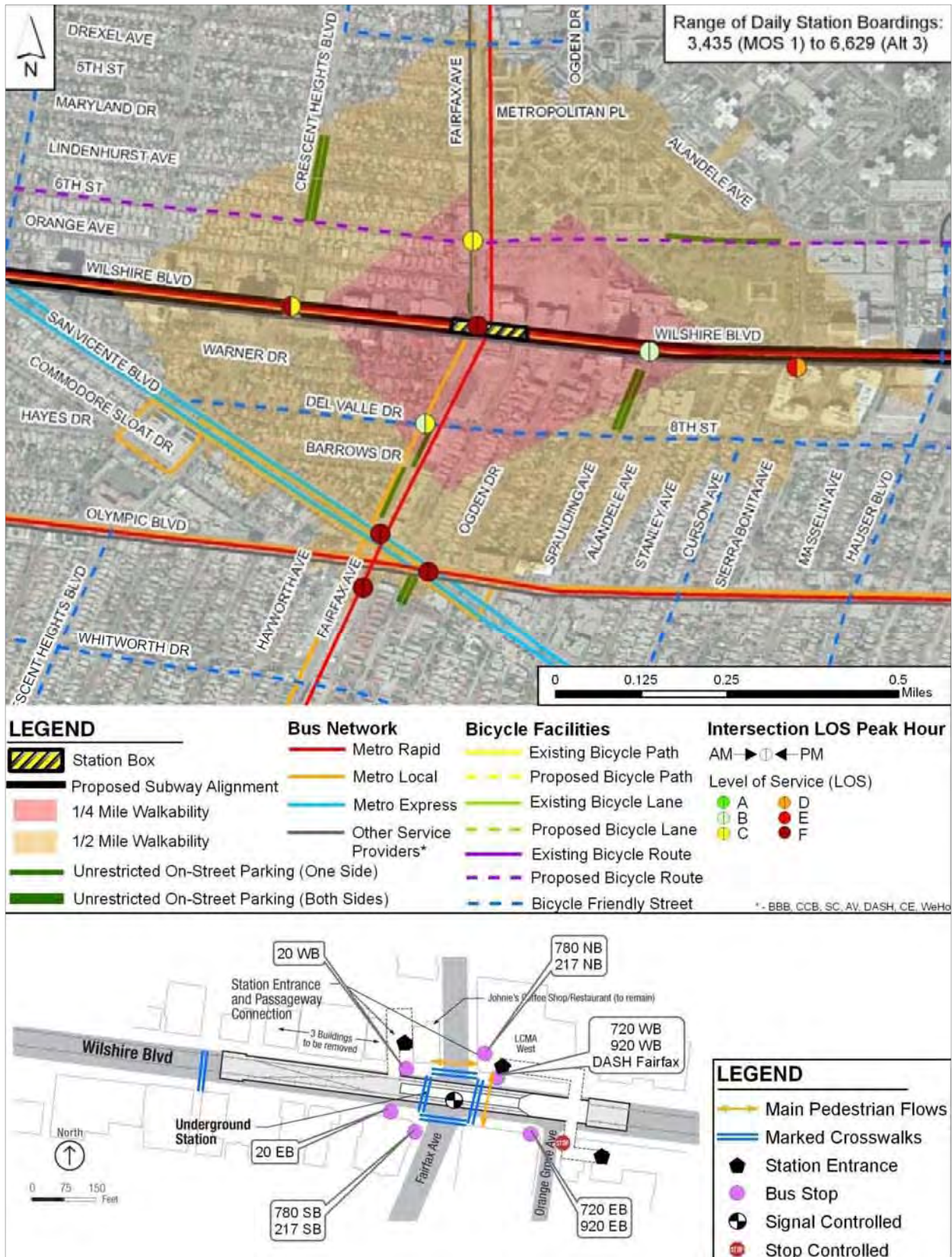


Figure 1-5. Wilshire/Fairfax Optional Station

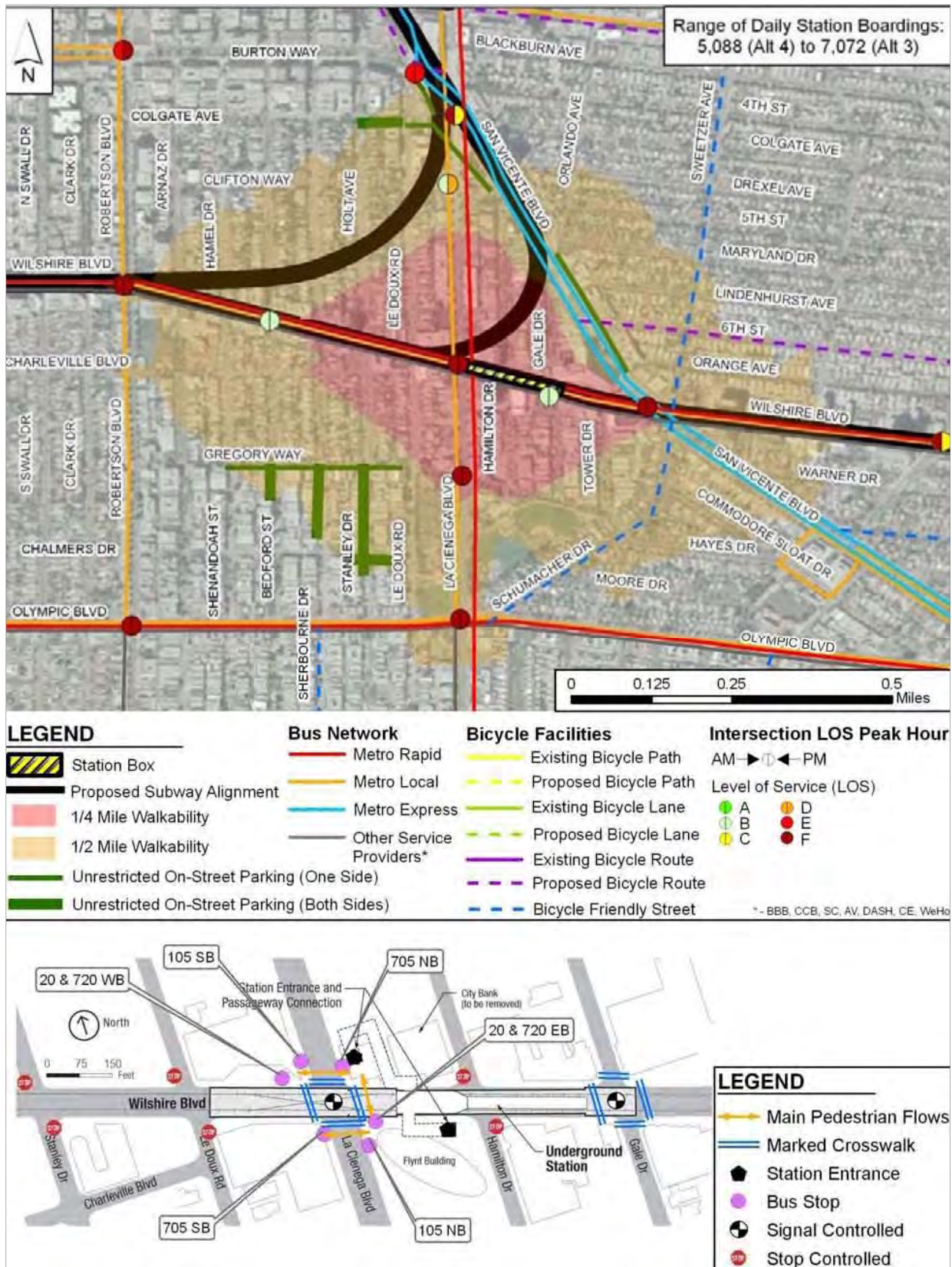


Figure 1-6. Wilshire/La Cienega Station

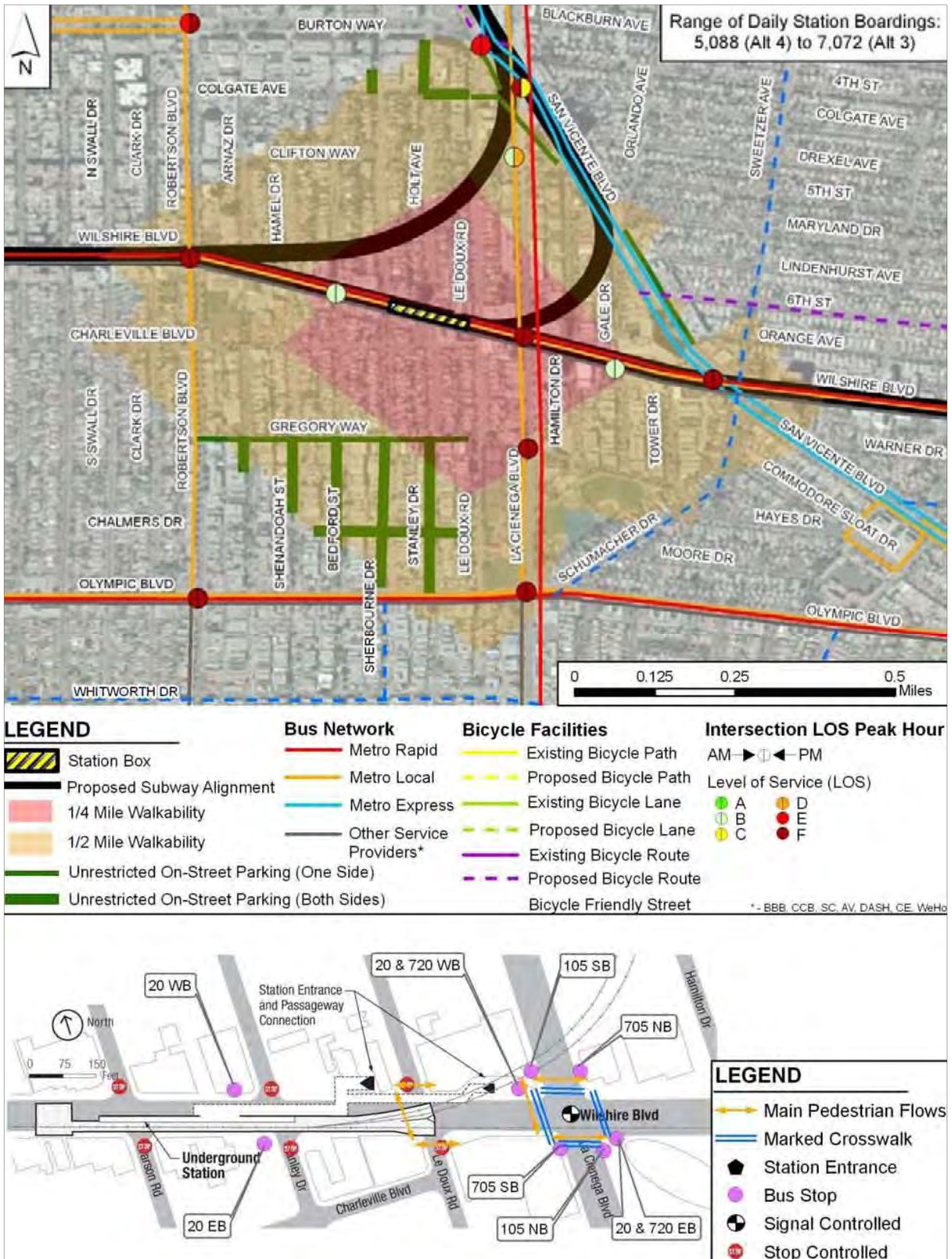


Figure 1-7. Wilshire/La Cienega Optional Station

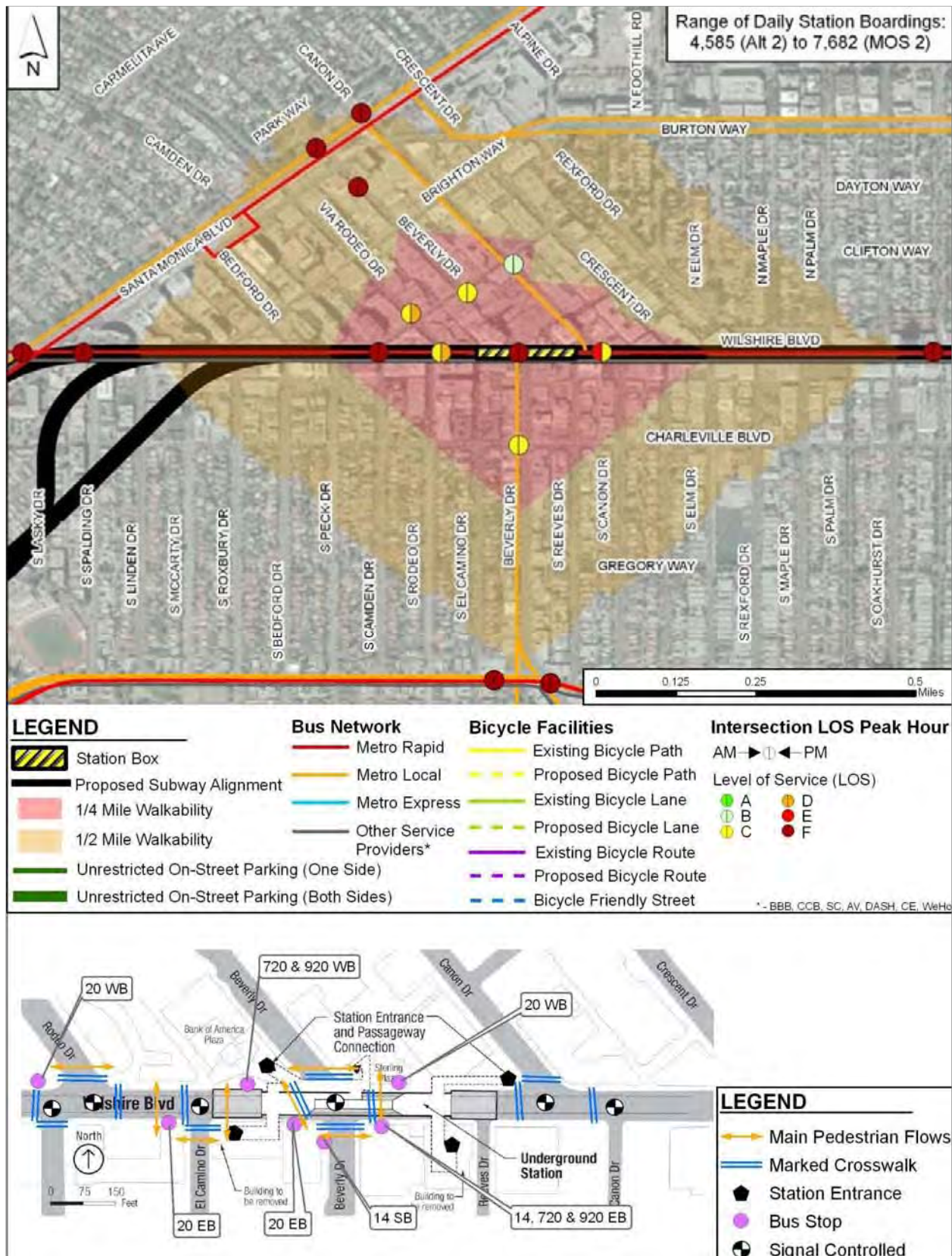


Figure 1-8. Wilshire/Rodeo Station

WESTSIDE SUBWAY EXTENSION

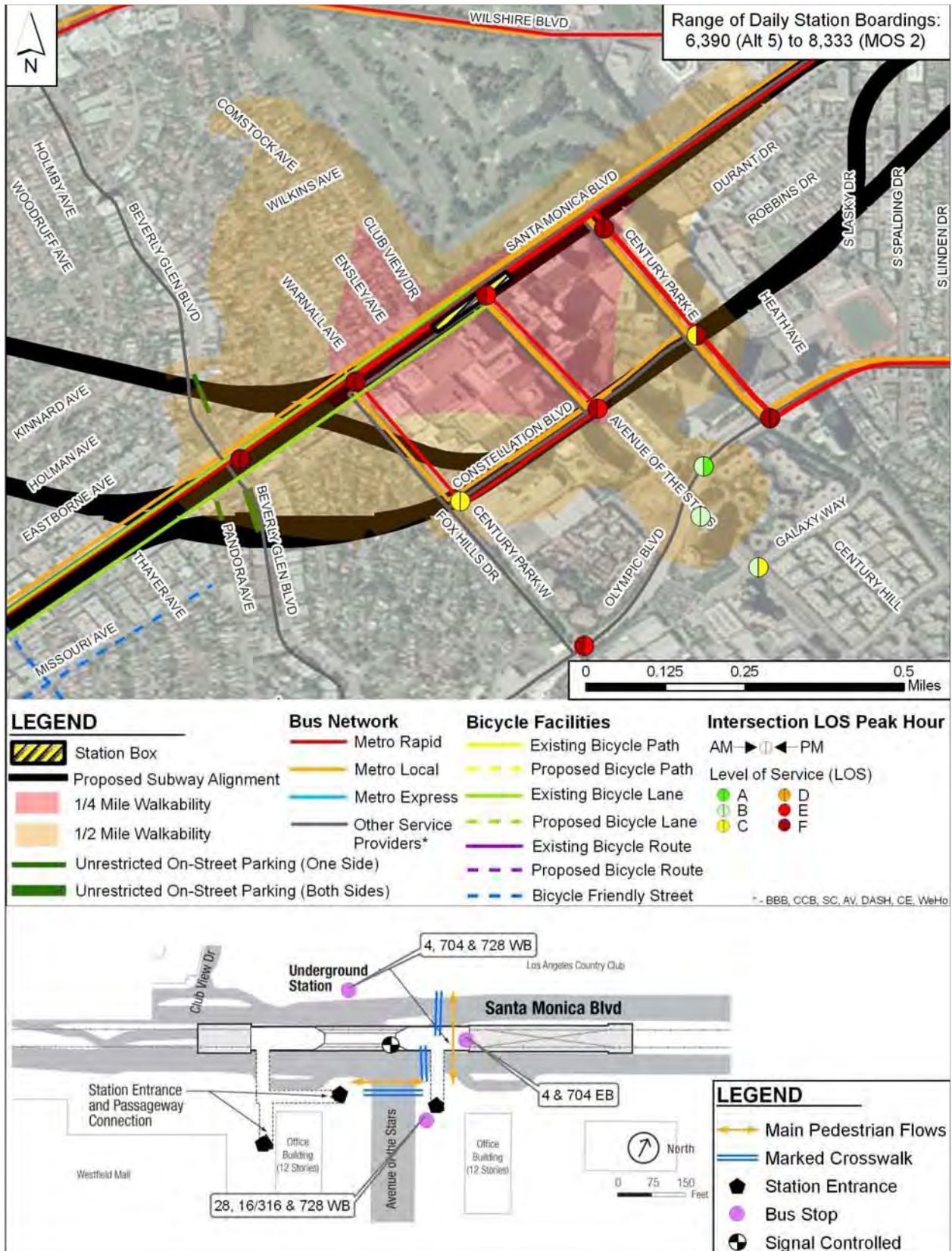


Figure 1-9. Century City Station

WESTSIDE SUBWAY EXTENSION

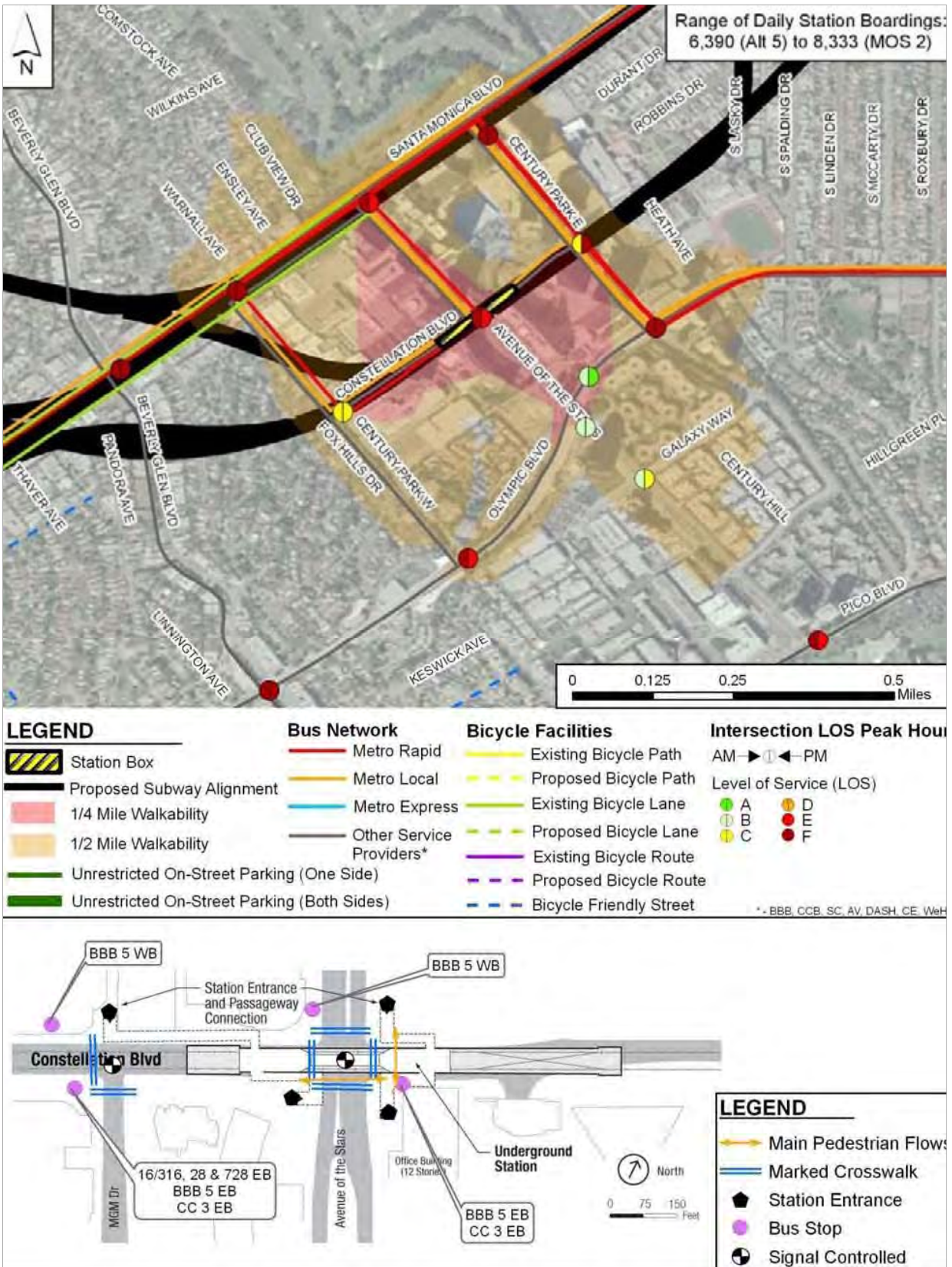


Figure 1-10. Century City Optional Station

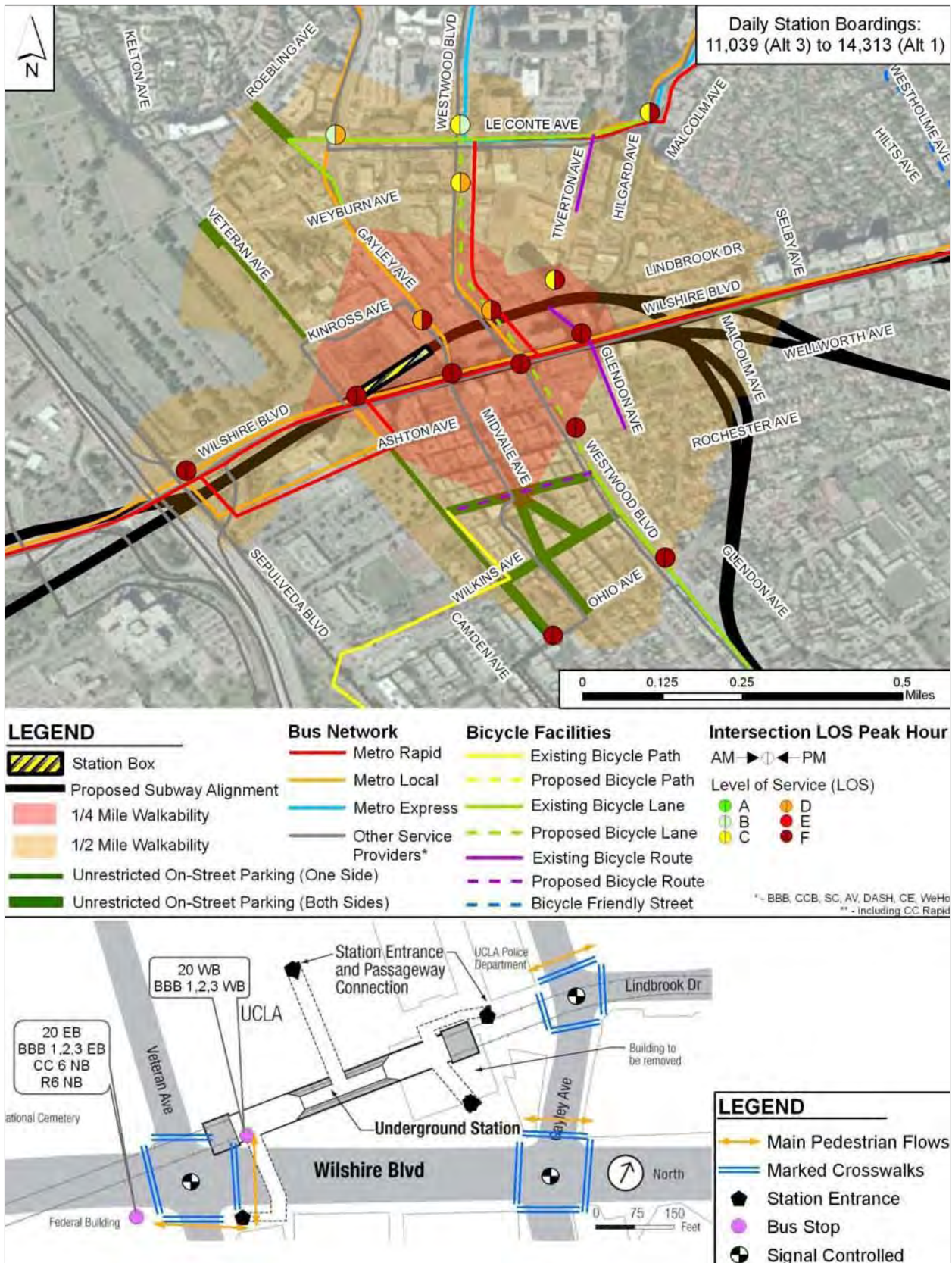


Figure 1-11. Westwood/UCLA Station

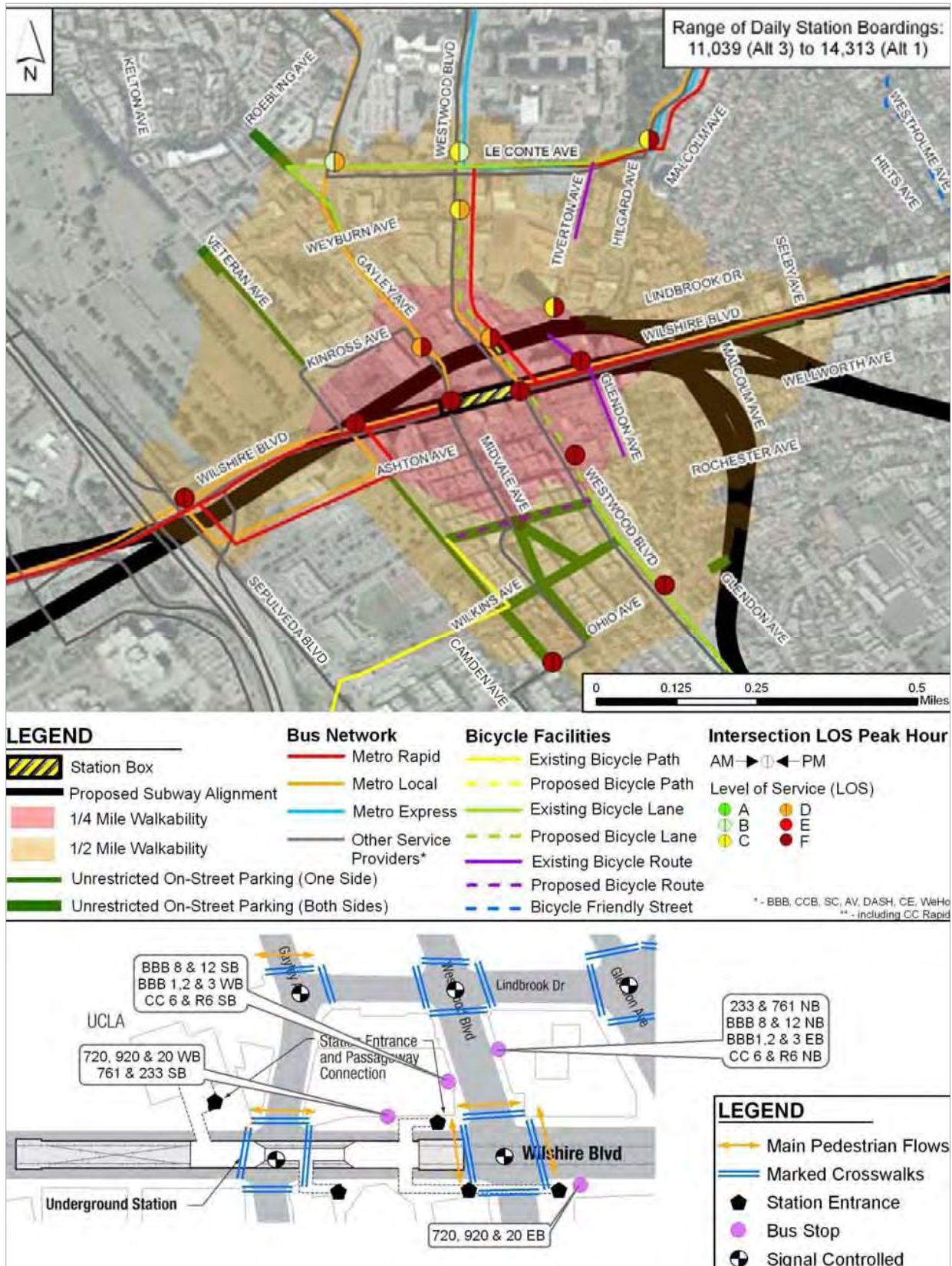


Figure 1-12. Westwood/UCLA Optional Station

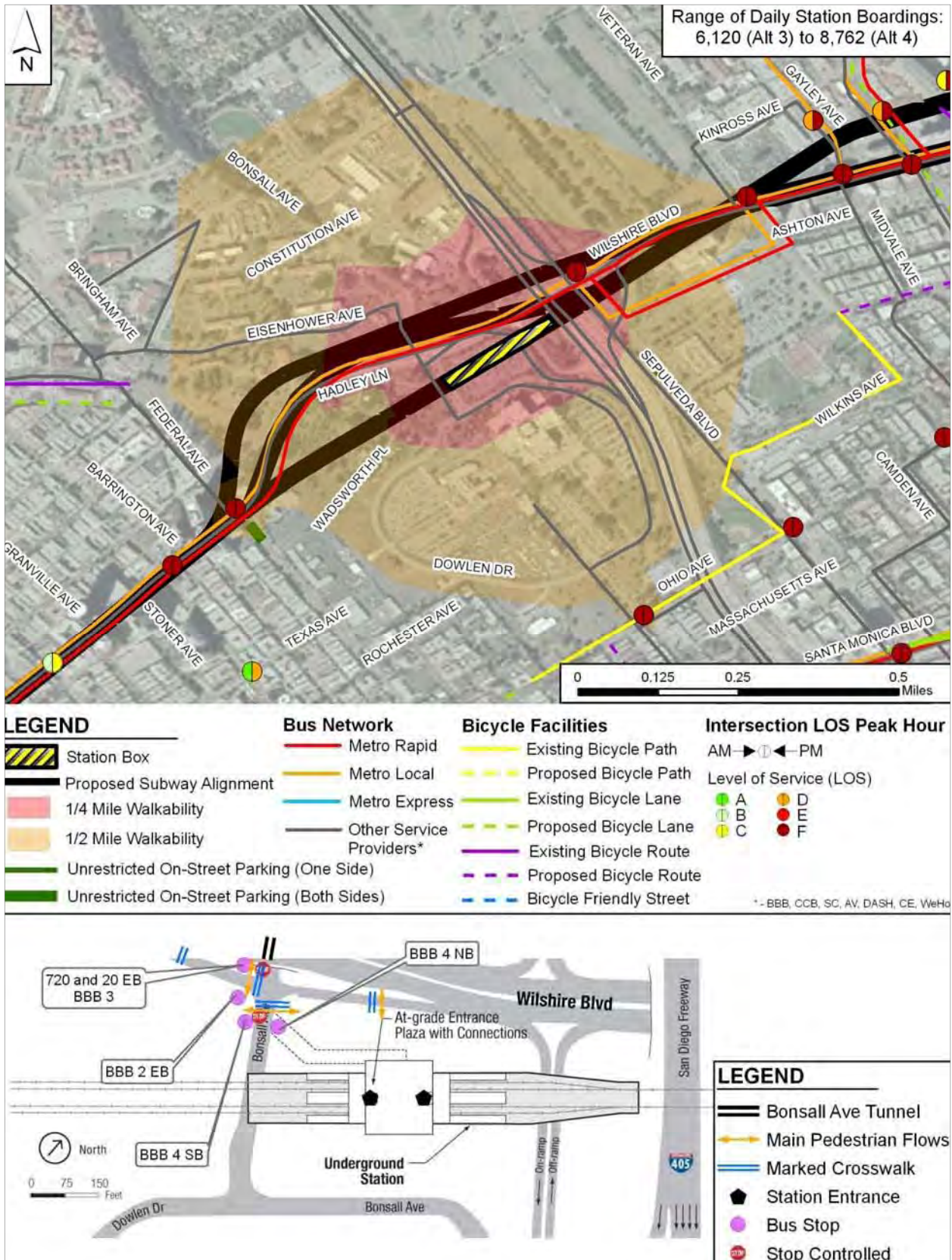


Figure 1-13. Westwood/VA Hospital Station

WESTSIDE SUBWAY EXTENSION

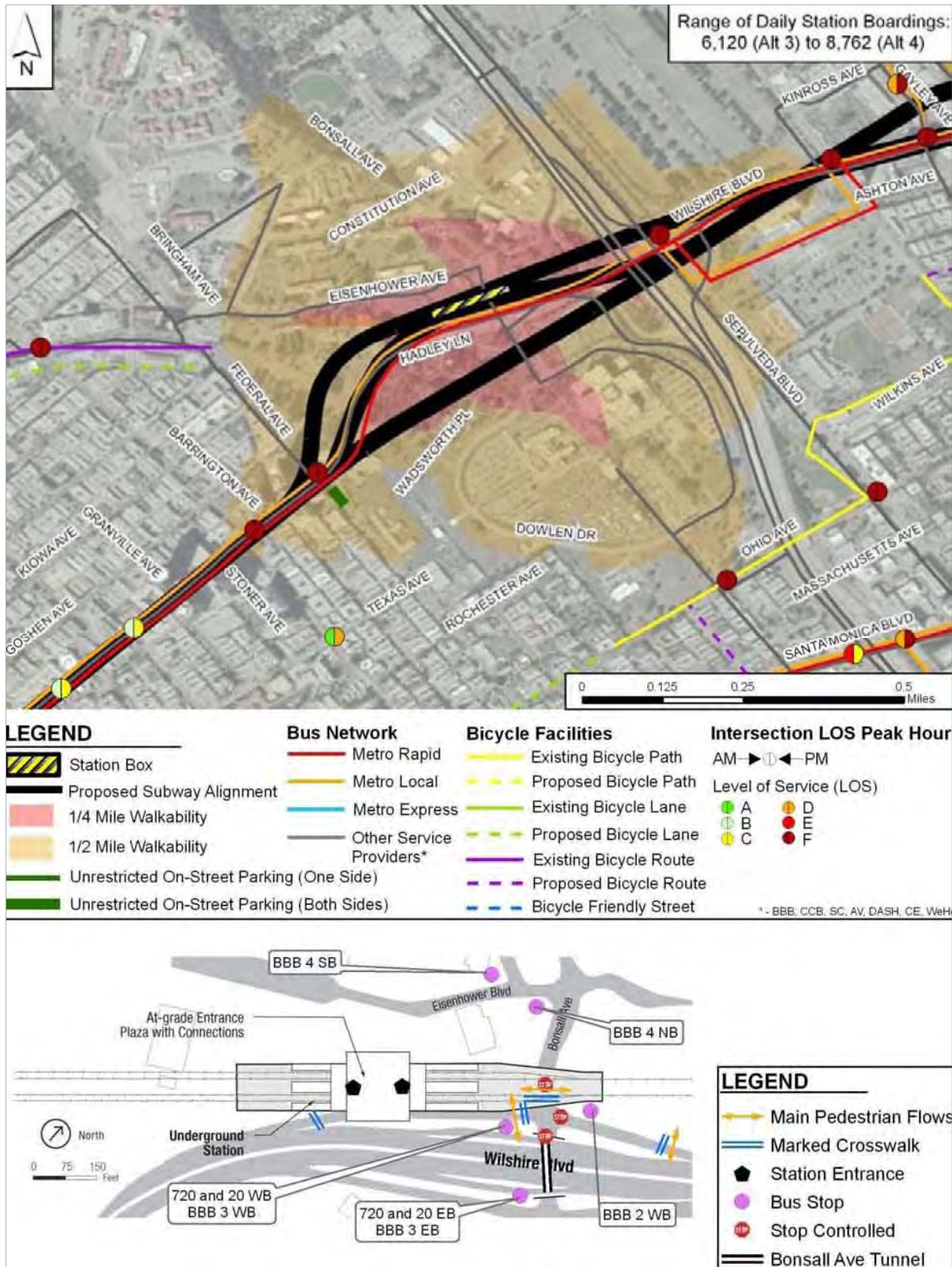


Figure 1-14. Westwood/VA Hospital Optional Station

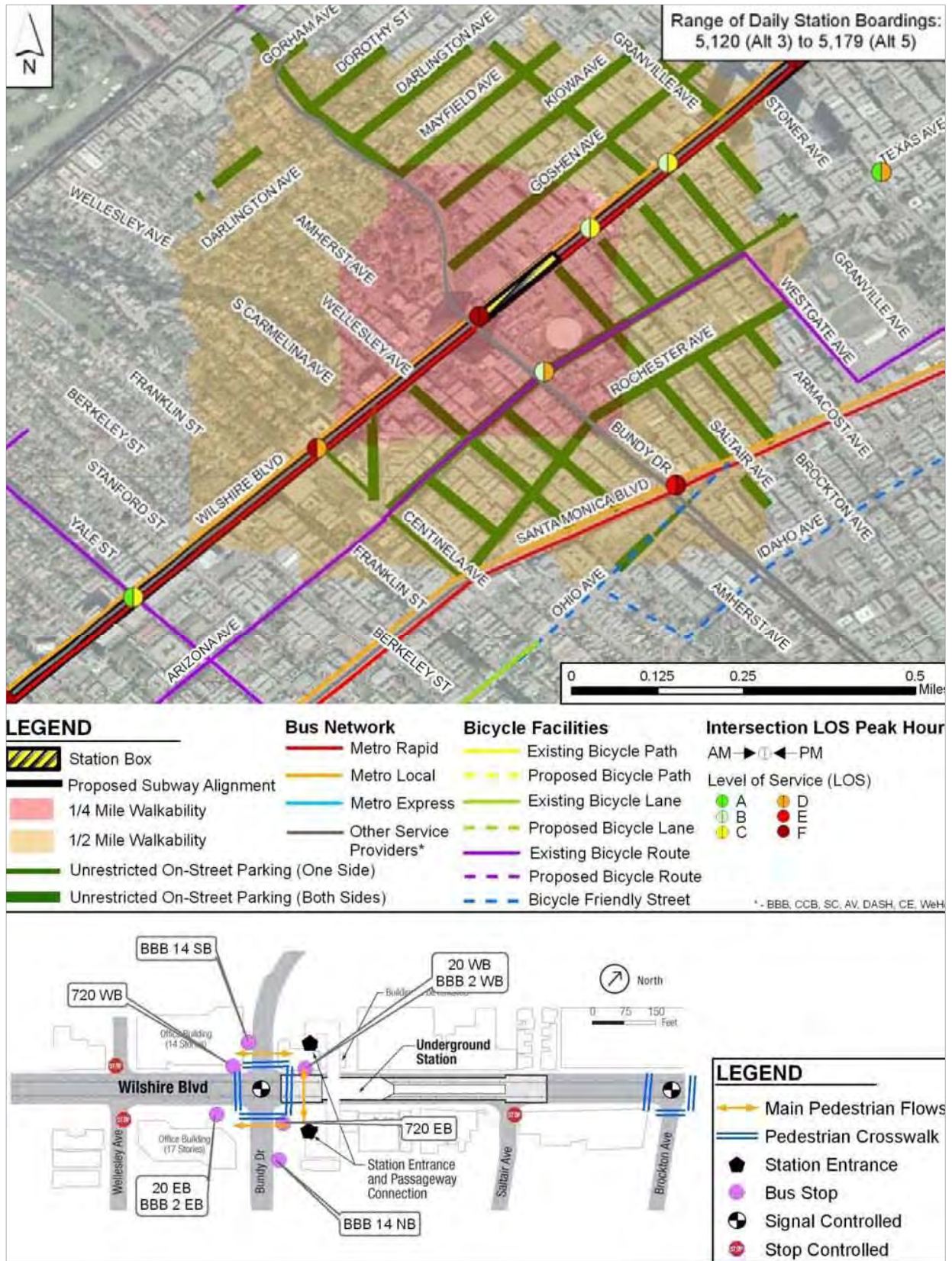


Figure 1-15. Wilshire/Bundy Station

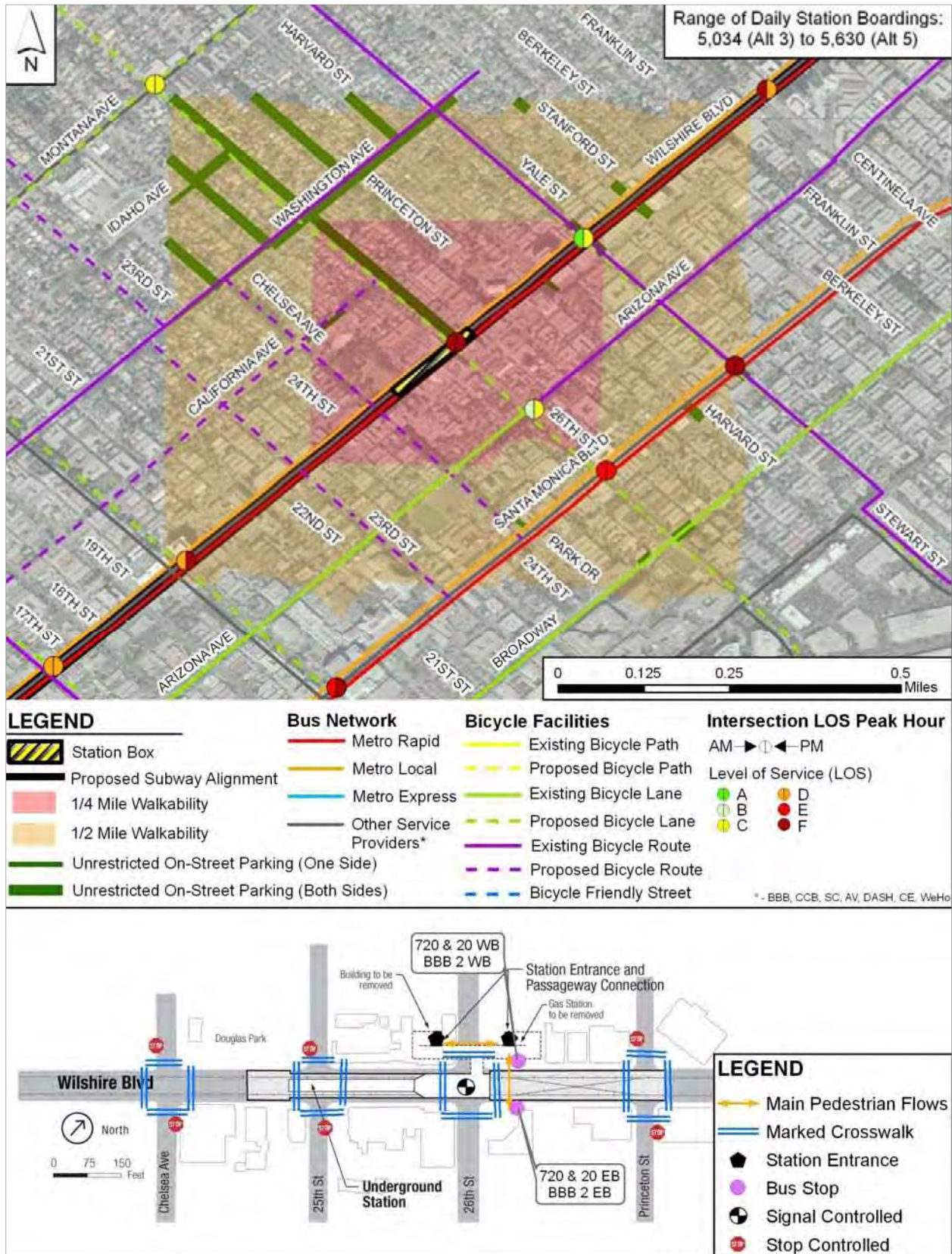


Figure 1-16. Wilshire/26th Station

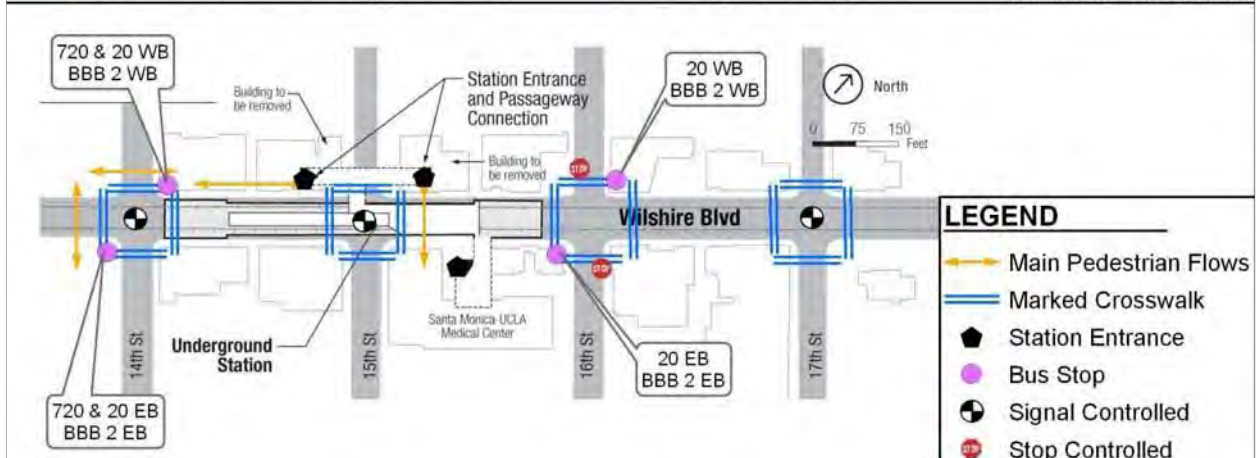


Figure 1-17. Wilshire/16th Station

WESTSIDE SUBWAY EXTENSION

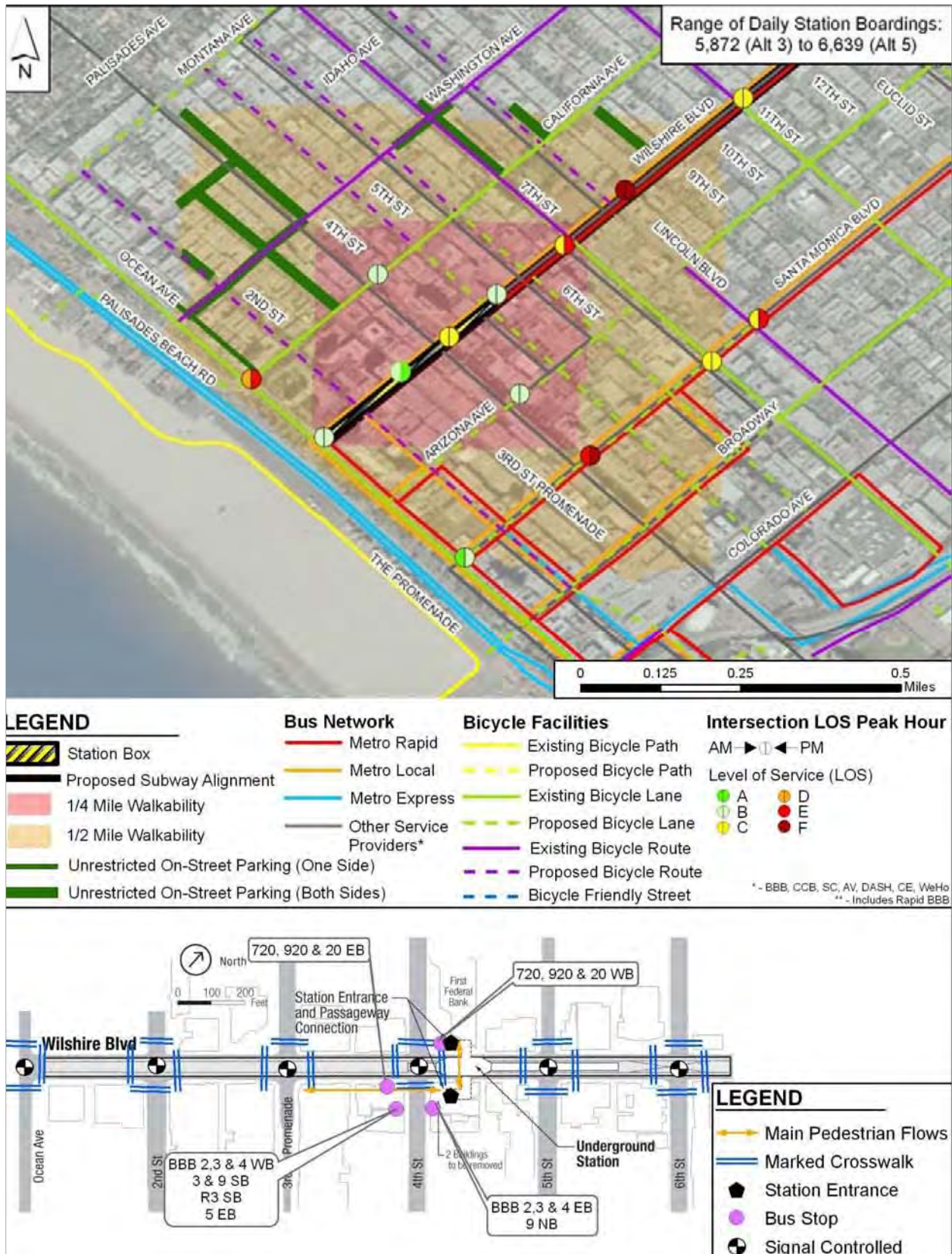


Figure 1-18. Wilshire/4th Station

WESTSIDE SUBWAY EXTENSION

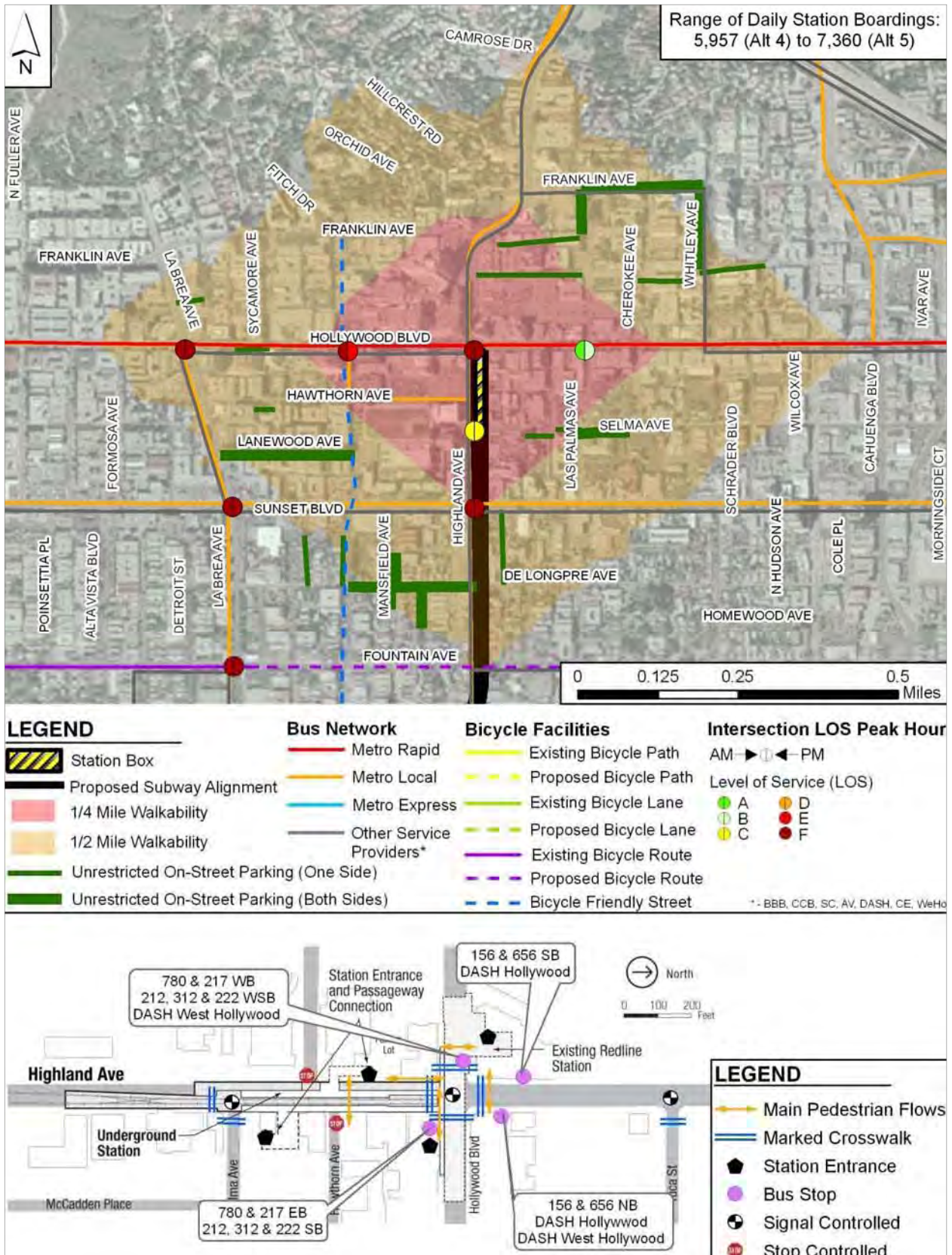


Figure 1-19. Hollywood/Highland Station

WESTSIDE SUBWAY EXTENSION

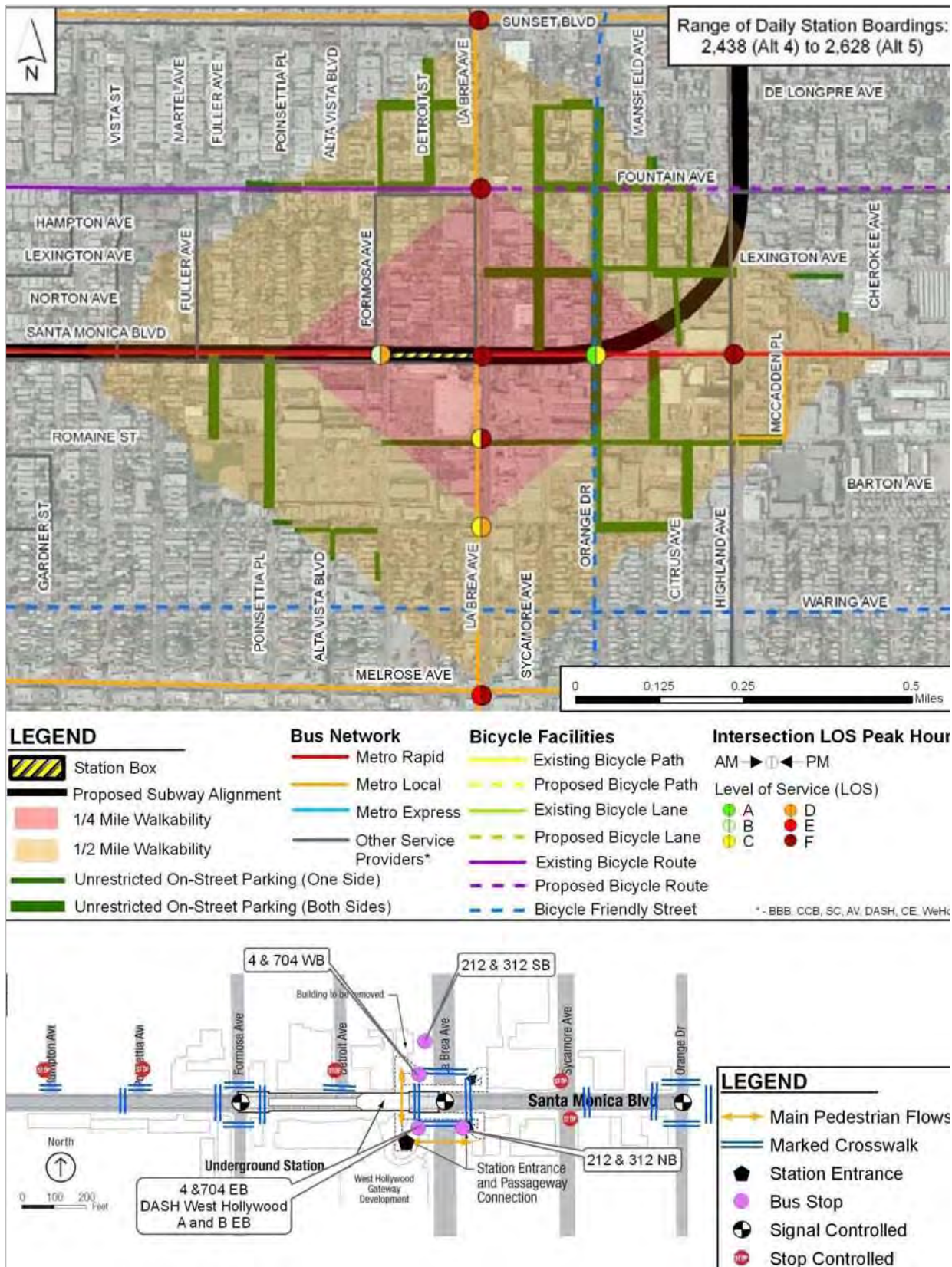


Figure 1-20. Santa Monica/La Brea Station

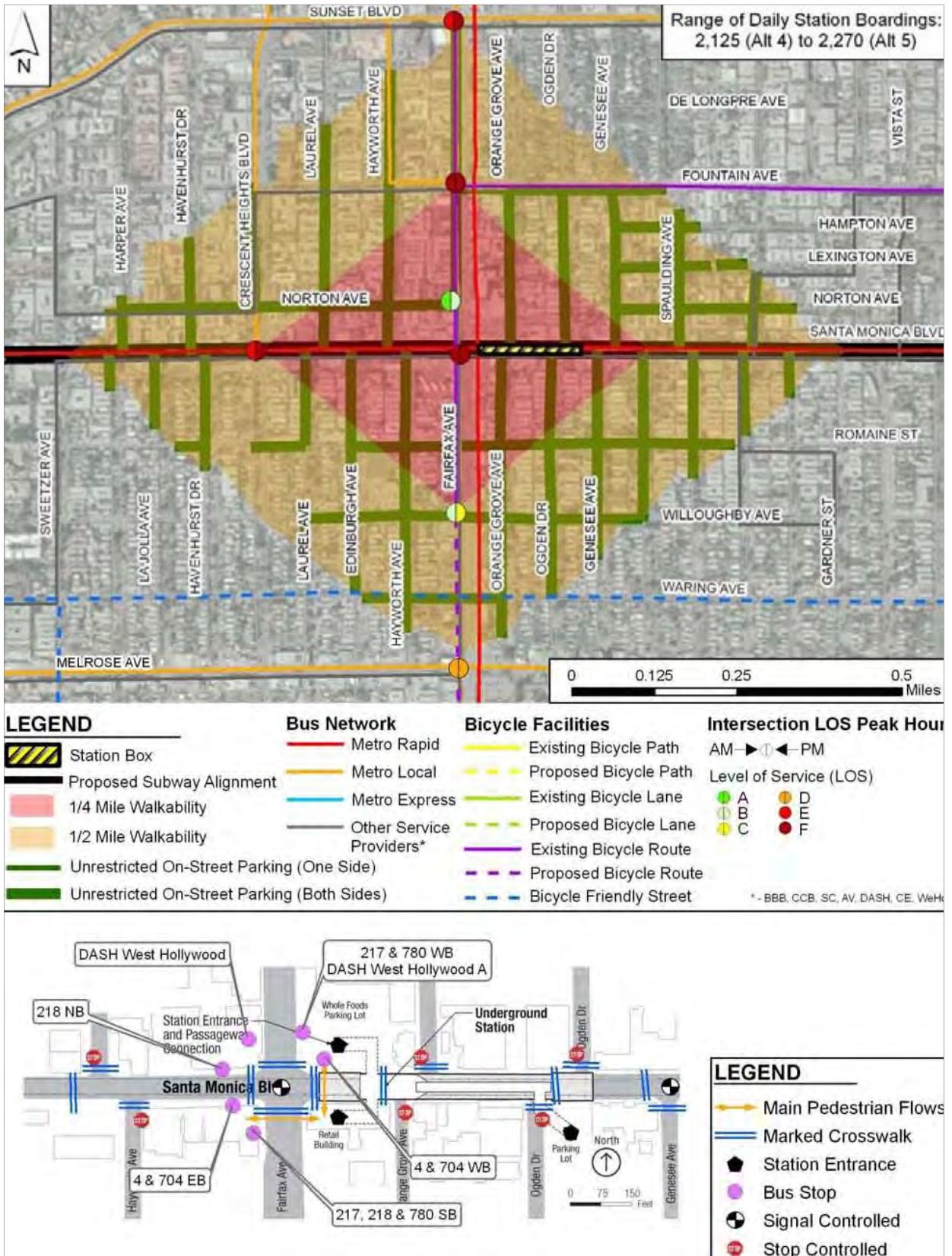


Figure 1-21. Santa Monica/Fairfax Station



Figure 1-22. Santa Monica/San Vicente Station

WESTSIDE SUBWAY EXTENSION



Figure 1-23. Beverly Center Area Station



1.2 Impact Assessment

This report uses defined impact criteria to assess quantitatively and qualitatively how the proposed project would affect the transportation system. These criteria were developed in consultation with Metro as a means of accurately evaluating the magnitude of an environmental impact and determining whether the impact would exceed a reasonable threshold of significance. In this section, the criteria that were used to analyze how the existing transportation system could be impacted by operation of the proposed subway are presented.

1.2.1 Transit and Non-Motorized Criteria

For the transit impact analysis, the evaluation of significance under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) was conducted at the station-area level, where the potential for localized impacts could occur. Two criteria were developed and applied at the station-area level for determination of impacts for each of the Project Alternatives:

- Would the location of project station entrances lead to excessive delays for riders transferring to interfacing bus transit lines? For the purposes of this analysis, excessive delay has been defined as the need to cross more than one roadway, or walk at least one full block to transfer between subway and bus.
- Would the location of project station entrances have the potential to increase pedestrian/bicycle safety hazards? For the purposes of this analysis, safety hazards have been defined as the need for pedestrians and bicyclists to cross roadways of more than two lanes at unsignalized locations, or at locations where marked crosswalks are not installed.

1.2.2 Traffic Criteria

For the traffic impact analysis, the evaluation of significance is defined by comparing the 2035 traffic forecasts of the Build Alternative scenarios to the No Build scenario. Intersection level of service analysis assumes that an intersection would be significantly impacted under CEQA and adversely affected under NEPA by traffic volume changes if a project alternative causes an increase in average delay according to the following thresholds:

- Final LOS C: A significant/adverse impact has occurred if the delay is increased by 10 or more seconds.
- Final LOS D: A significant/adverse impact has occurred if the delay is increased by 7.5 or more seconds.
- Final LOS E/F: A significant/adverse impact has occurred if the delay is increased by 5 or more seconds.

1.2.3 Parking Criteria

The parking impact analysis is primarily comprised of an analysis of spillover parking. The potential for spillover parking impacts are assessed according to the following criteria:

- Is there unrestricted parking located within a one-half mile walking distance of potential stations?



- Would maximum daily Westside Subway Extension parking demand exceed available supply?
- Is unrestricted parking located on streets that are primarily residential?

To be considered an impact, a station area would need to meet Criterion 1, and either Criterion 2 or Criterion 3. A station area that does not meet Criterion 1 would not be impacted.

1.3 Station Area Impacts

Station area impacts assessed for the interface of transit, pedestrians, and bicycles are presented in Table 1-1. Because it has the most stations of any alternative, Alternative 5 is projected to have the most impacted station areas. In cases where station area impacts depend on chosen station entrances, impacts are listed as potential impacts.

The positive effects of the subway on traffic congestion can be seen in Table 1-2, which shows changes in intersection level of service (LOS) near proposed station locations. A station area was defined as improved if intersection LOS changed from F to E, E to D, D to C, C to B, or B to A at one or more study intersections within a half-mile of the station.

Traffic impacts are shown in Table 1-3. Based on the above criteria, traffic impact analysis found that no study intersection exceeded the threshold for a significant/adverse traffic impact under MOS 1, MOS 2, Alternative 1, Alternative 2, or Alternative 4. For Alternative 3 and Alternative 5, only one intersection would be expected to exceed the impact criteria and result in a significant/adverse impact.

Table 1-4 summarizes parking impacts. Since the project is not providing park-and-ride facilities, close attention was paid to the potential for subway riders to park in local neighborhoods. Alternative 5 has the greatest number of proposed station locations, and this is reflected in its potential to impact spillover parking at the greatest number of locations among the Build Alternatives.

1.4 Transportation Benefits

In comparing the Build Alternative with No Build and TSM alternatives, several major benefits would be expected. Since the Build Alternatives involve operations in exclusive guideways, transit speeds, resulting travel times, and service reliability would all be enhanced in the Study Area as compared to the No Build and TSM Alternatives. Transit operating speeds under the Build Alternatives would about twice as high as the No Build and TSM alternatives.

The service characteristics of the Build Alternatives would result in higher ridership levels as compared to No Build and TSM Alternatives. This added ridership would include demand shifted from auto travel to transit.

Table 1-1. Transit and Non-Motorized Impact Summary

Station	MOS 1	MOS 2	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
1. Wilshire/Crenshaw Station	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
2. Wilshire/La Brea Station	Potential*	Potential*	Potential*	Potential*	Potential*	Potential*	Potential*
3. Wilshire/Fairfax Station	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
Optional Station	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
4. Wilshire/La Cienega Station	—	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
Optional Station	—	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
5. Wilshire/Rodeo Station	—	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
6. Century City Station	—	Potential*	Potential*	Potential*	Potential*	Potential*	Potential*
Optional Station	—	Potential*	Potential*	Potential*	Potential*	Potential*	Potential*
7. Westwood/UCLA Station	—	—	Impacted	Impacted	Impacted	Impacted	Impacted
Optional Station	—	—	Impacted	Impacted	Impacted	Impacted	Impacted
8. Westwood/VA Hospital Station	—	—	—	Impacted	Impacted	Impacted	Impacted
Optional Station	—	—	—	Impacted	Impacted	Impacted	Impacted
9. Wilshire/Bundy Station	—	—	—	—	Impacted	—	Impacted
10. Wilshire/26th Station	—	—	—	—	Potential*	—	Potential*
11. Wilshire/16th Station	—	—	—	—	Impacted	—	Impacted
12. Wilshire/4th Station	—	—	—	—	Potential*	—	Potential*
13. Hollywood/Highland Station	—	—	—	—	—	Potential*	Potential*
14. Santa Monica/La Brea Station	—	—	—	—	—	Potential*	Potential*
15. Santa Monica/Fairfax Station	—	—	—	—	—	Impacted	Impacted
16. Santa Monica/San Vicente Station	—	—	—	—	—	Impacted	Impacted
17. Beverly Center Area Station	—	—	—	—	—	Impacted	Impacted
<i>Total Impacted Station Areas</i>	<i>2</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>8</i>	<i>9</i>	<i>11</i>

Source: Fehr & Peers, April 2010

Note: * Station area would not be impacted if recommended entrance is constructed. Otherwise station area would be impacted.

** Impact totals reflect the fact that either the preferred station or the optional station will be built at station areas, not both.

Table 1-2. Level of Service Improvements at Station Area Study Intersections

Station	MOS 1	MOS 2	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
1. Wilshire/Crenshaw Station	Improved	Improved	Improved	Improved	Improved	Improved	Improved
2. Wilshire/La Brea Station	Improved	Improved	Improved	Improved	Improved	Improved	Improved
3. Wilshire/Fairfax Station	Improved	Improved	Improved	Improved	Improved	Improved	Improved
Optional Station	Improved	Improved	Improved	Improved	Improved	Improved	Improved
4. Wilshire/La Cienega Station	Improved	Improved	Improved	Improved	Improved	Improved	Improved
Optional Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
5. Wilshire/Rodeo Station	No Change	Improved	Improved	Improved	Improved	Improved	Improved
6. Century City Station	No Change	Improved	Improved	Improved	Improved	Improved	Improved
Optional Station	No Change	Improved	Improved	Improved	Improved	Improved	Improved
7. Westwood/UCLA Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
Optional Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
8. Westwood/VA Hospital Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
Optional Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
9. Wilshire/Bundy Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
10. Wilshire/26th Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
11. Wilshire/16th Station	No Change	No Change	No Change	No Change	Improved	No Change	Improved
12. Wilshire/4th Station	No Change	No Change	No Change	No Change	Improved	No Change	Improved
13. Hollywood/Highland Station	No Change	No Change	No Change	No Change	No Change	No Change	No Change
14. Santa Monica/La Brea Station	No Change	No Change	No Change	No Change	No Change	Improved	Improved
15. Santa Monica/Fairfax Station	No Change	No Change	No Change	No Change	No Change	Improved	Improved
16. Santa Monica/San Vicente Station	No Change	No Change	No Change	No Change	No Change	Improved	Improved
17. Beverly Center Area Station	No Change	No Change	No Change	No Change	No Change	Improved	Improved
<i>Total Improved Station Areas (with Preferred Station Locations)</i>	<i>4</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>8</i>	<i>10</i>	<i>12</i>
<i>Total Improved Station Areas (with Optional Station Locations)</i>	<i>3</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>7</i>	<i>9</i>	<i>11</i>

Source: Fehr & Peers, April 2010 Alt

Table 1-3. Traffic Impact Summary Table

Peak Hour	Alt 1	MOS 1	MOS 2	Alt 2	Alt 3	Alt 4	Alt 5
AM Peak Hour	None	None	None	None	Wilshire Boulevard and 16th Street	None	Wilshire Boulevard and 16th Street
PM Peak Hour	None	None	None	None	Wilshire Boulevard and 16th Street	None	Wilshire Boulevard and 16th Street

Table 1-4. Parking Impact Summary

Station	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	MOS 1	MOS 2
1. Wilshire/Crenshaw Station	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
2. Wilshire/La Brea Station	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
3. Wilshire/Fairfax Station	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
Optional Station	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted	Impacted
4. Wilshire/La Cienega Station	Impacted	Impacted	Impacted	Impacted	Impacted	None	Impacted
Optional Station	Impacted	Impacted	Impacted	Impacted	Impacted	None	Impacted
5. Wilshire/Rodeo Station	None	None	None	None	None	None	None
6. Century City Station	Impacted	Impacted	Impacted	Impacted	Impacted	None	Impacted
Optional Station	None	None	None	None	None	None	None
7. Westwood/UCLA Station	Impacted	Impacted	Impacted	Impacted	Impacted	None	None
Optional Station	Impacted	Impacted	Impacted	Impacted	Impacted	None	None
8. Westwood/VA Hospital Station	None	Impacted	Impacted	Impacted	Impacted	None	None
Optional Station	None	Impacted	Impacted	Impacted	Impacted	None	None
9. Wilshire/Bundy Station	None	None	Impacted	None	Impacted	None	None
10. Wilshire/26th Station	None	None	Impacted	None	Impacted	None	None
11. Wilshire/16th Station	None	None	Impacted	None	Impacted	None	None
12. Wilshire/4th Station	None	None	Impacted	None	Impacted	None	None
13. Hollywood/Highland Station	None	None	None	Impacted	Impacted	None	None
14. Santa Monica/La Brea Station	None	None	None	Impacted	Impacted	None	None
15. Santa Monica/Fairfax Station	None	None	None	Impacted	Impacted	None	None
16. Santa Monica/San Vicente Station	None	None	None	Impacted	Impacted	None	None
17. Beverly Center Area Station	None	None	None	Impacted	Impacted	None	None
<i>Total Impacted Station Areas</i>	<i>6</i>	<i>7</i>	<i>11</i>	<i>12</i>	<i>16</i>	<i>3</i>	<i>5</i>
<i>Total Impacted Station Areas (with Optional Station Locations)</i>	<i>5</i>	<i>6</i>	<i>10</i>	<i>11</i>	<i>15</i>	<i>3</i>	<i>4</i>

Source: Fehr & Peers, January 2010

1.5 Mitigation Measures

Where impacts were found, proposed mitigation measures are expected to mitigate all significant and adverse impacts to below thresholds of significance. With no remaining negative impacts after mitigation, the subway would ultimately result in a highly beneficial impact on the transportation system, improving mobility and accessibility on the Westside and within the Los Angeles County region.

Transit, pedestrian, and bicycle impacts would be mitigated by implementing the following measures, either alone or in combination, as required on a station-by-station basis:

- Relocation or consolidation of bus stops
- Installation of marked crosswalks
- Signalization of an intersection
- Construction of a bus turnaround
- Relocation of the subway station entrance



Parking impacts would be addressed by implementing one or more of the following proposed measures:

- Residential permit parking program
- Parking benefits district
- Shared parking program with operators of off-street parking facilities

In sum, the transportation assessment for a potential Westside Subway Extension would have overall benefits to the Study in terms of key transit characteristics such as travel time and reliability. The assessment included detailed analysis of potential impacts involving traffic, parking, and station area effects on pedestrians and bicyclists. The traffic assessment identified one location with impacts that could be addressed with mitigation. For parking and station area items, the assessment identified potential mitigation items to address potential impacts.



2.0 INTRODUCTION

This report documents the traffic, parking, transit, bicycle, and pedestrian impacts of the No Build, TSM and the Build Alternatives (as refined based on analysis results/policy decisions) of the Westside Subway Extension.

This report describes the existing transportation conditions in the Study Area and analyzes the potential transportation impacts associated with the implementation of the Transportation System Management (TSM) Alternative, the two Minimum Operable Segments (MOSs), and the five Build Alternatives by comparing these scenarios to the conditions anticipated with the implementation of the No Build Alternative. Mitigation measures intended to address project-related adverse impacts that comply with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) are recommended in this report. The potential for construction period impacts is also assessed and mitigation measures are recommended.

The analysis of transportation-related impacts and mitigation measures follows the NEPA process. While CEQA requires that only “significant impacts” be identified in an Environmental Impact Report, NEPA requires that all adverse impacts of a proposed project be analyzed. Accordingly, in this joint federal and state environmental document, reference to “significant impacts” is made to fulfill this requirement under CEQA, pursuant to standards of California law. However, regardless of level of significance, all potentially adverse environmental impacts have been analyzed and mitigation proposed where feasible to reduce identified adverse effects.

2.1 Environmental Areas of Analysis

Analysis of the environmental issue areas is organized under three structural headings as follows.

2.1.1 Affected Environment

This discussion describes the project’s existing physical environment or baseline setting

2.1.2 Environmental Impacts/Environmental Consequences and Mitigation Measures

- Each environmental issue area is given a separate subsection and begins with a description of the methodology used to assess impacts
- Future No Build conditions are then developed to be used as a basis for which the impact assessment will be conducted
- For each project alternative, future conditions are developed and compared to future No Build conditions
- Adverse/significant impacts are identified and mitigation measures that would reduce or eliminate them are discussed

As the Westside Subway Extension EIS/EIR is a joint federal and state environmental document, thresholds are presented for both NEPA and CEQA purposes. The final discussion states the effectiveness of mitigation measures in reducing the identified impacts. Under CEQA, a final determination is made as to whether an identified impact can be reduced to a less-than-significant level, or remains significant and unavoidable.



2.1.3 Construction Impacts

For the construction periods, impacts to the transportation network are identified and mitigation measures that would minimize or eliminate them are discussed.



3.0 PROJECT DESCRIPTION

This section describes the alternatives that have been considered to best satisfy the Purpose and Need and have been carried forward for further study in the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR). Details of the No Build, Transportation Systems Management (TSM), and the five Build Alternatives (including their station and alignment options and phasing options (or minimum operable segments [MOS]) are presented in this section.

3.1 No Build Alternative

The No Build Alternative provides a comparison of what future conditions would be like if the Project were not built. The No Build Alternative includes all existing highway and transit services and facilities, and the committed highway and transit projects in the Metro LRTP and the SCAG RTP. Under the No Build Alternative, no new transportation infrastructure would be built within the Study Area, aside from projects currently under construction or projects funded for construction, environmentally cleared, planned to be in operation by 2035, and identified in the adopted Metro LRTP.

3.2 TSM Alternative

The TSM Alternative emphasizes more frequent bus service than the No Build Alternative to reduce delay and enhance mobility. The TSM Alternative contains all elements of the highway, transit, Metro Rail, and bus service described under the No Build Alternative. In addition, the TSM Alternative increases the frequency of service for Metro Bus Line 720 (Santa Monica–Commerce via Wilshire Boulevard and Whittier Boulevard) to between three and four minutes during the peak period.

In the TSM Alternative, Metro Purple Line rail service to the Wilshire/Western Station would operate in each direction at 10-minute headways during peak and off-peak periods. The Metro Red Line service to Hollywood/Highland Station would operate in each direction at five-minute headways during peak periods and at 10-minute headways during midday and off-peak periods.

3.3 Build Alternatives

The Build Alternatives are considered to be the “base” alternatives with “base” stations. Alignment (or segment) and station options were developed in response to public comment, design refinement, and to avoid and minimize impacts to the environment.

The Build Alternatives extend heavy rail transit (HRT) service in subway from the existing Metro Purple Line Wilshire/Western Station. HRT systems provide high speed (maximum of 70 mph), high capacity (high passenger-carrying capacity of up to 1,000 passengers per train and multiple unit trains with up to six cars per train), and reliable service since they operate in an exclusive grade-separated right-of-way. The subway will operate in a tunnel at least 30 to 70 feet below ground and will be electric powered.

Furthermore, the Build Alternatives include changes to the future bus services. Metro Bus Line 920 would be eliminated and a portion of Line 20 in the City of Santa Monica would be eliminated since it would be duplicated by the Santa Monica Blue Bus Line 2. Metro Rapid



Bus Line 720 would operate less frequently since its service route would be largely duplicated by the Westside Subway route. In the City of Los Angeles, headways (time between buses) for Line 720 are between 3 and 5 minutes under the existing network and will be between 5 and 11.5 minutes under the Build Alternatives, but no change in Line 720 would occur in the City of Santa Monica segment. Service frequencies on other Metro Rail lines and bus routes in the corridor would be the same as for the No Build Alternative.

3.3.1 Alternative 1—Westwood/UCLA Extension

This alternative extends the existing Metro Purple Line from the Wilshire/Western Station to a Westwood/UCLA Station (Figure 3-1). From the Wilshire/Western Station, Alternative 1 travels westerly beneath Wilshire Boulevard to the Wilshire/Rodeo Station and then southwesterly toward a Century City Station. Alternative 1 then extends from Century City and terminates at a Westwood/UCLA Station. The alignment is approximately 8.60 miles in length.

Alternative 1 would operate in each direction at 3.3-minute headways during morning and evening peak periods and at 10-minute headways during midday. The estimated one-way running time is 12 minutes 39 seconds from the Wilshire/Western Station.

3.3.2 Alternative 2—Westwood/Veterans Administration (VA) Hospital Extension

This alternative extends the existing Metro Purple Line from the Wilshire/Western Station to a Westwood/VA Hospital Station (Figure 3-2). Similar to Alternative 1, Alternative 2 extends the subway from the Wilshire/Western Station to a Westwood/UCLA Station. Alternative 2 then travels westerly under Veteran Avenue and continues west under the I-405 Freeway, terminating at a Westwood/VA Hospital Station. This alignment is 8.96 miles in length from the Wilshire/Western Station.

Alternative 2 would operate in each direction at 3.3-minute headways during the morning and evening peak periods and at 10-minute headways during the midday, off-peak period. The estimated one-way running time is 13 minutes 53 seconds from the Wilshire/Western Station.

3.3.3 Alternative 3—Santa Monica Extension

This alternative extends the existing Metro Purple Line from the Wilshire/Western Station to the Wilshire/4th Station in Santa Monica (Figure 3-3). Similar to Alternative 2, Alternative 3 extends the subway from the Wilshire/Western Station to a Westwood/VA Hospital Station. Alternative 3 then continues westerly under Wilshire Boulevard and terminates at the Wilshire/4th Street Station between 4th and 5th Streets in Santa Monica. The alignment is 12.38 miles.

Alternative 3 would operate in each direction at 3.3-minute headways during the morning and evening peak periods and operate with 10-minute headways during the midday, off-peak period. The estimated one-way running time is 19 minutes 27 seconds from the Wilshire/Western Station.

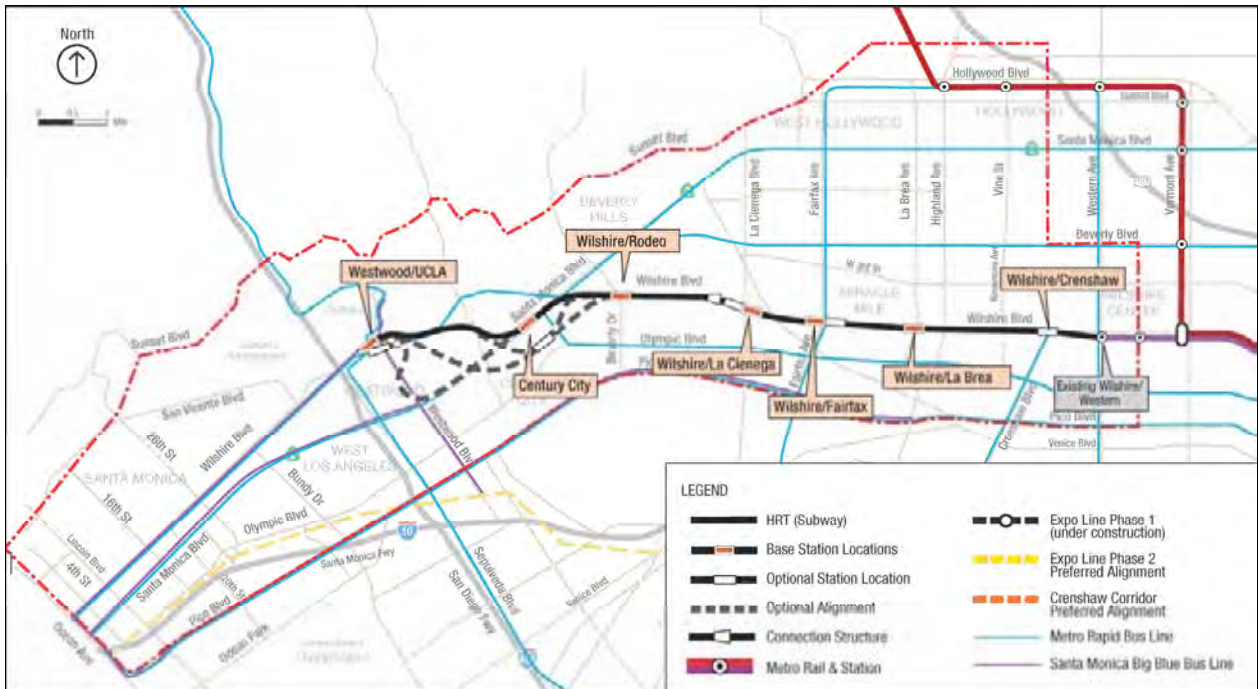


Figure 3-1. Alternative 1—Westwood/UCLA Extension

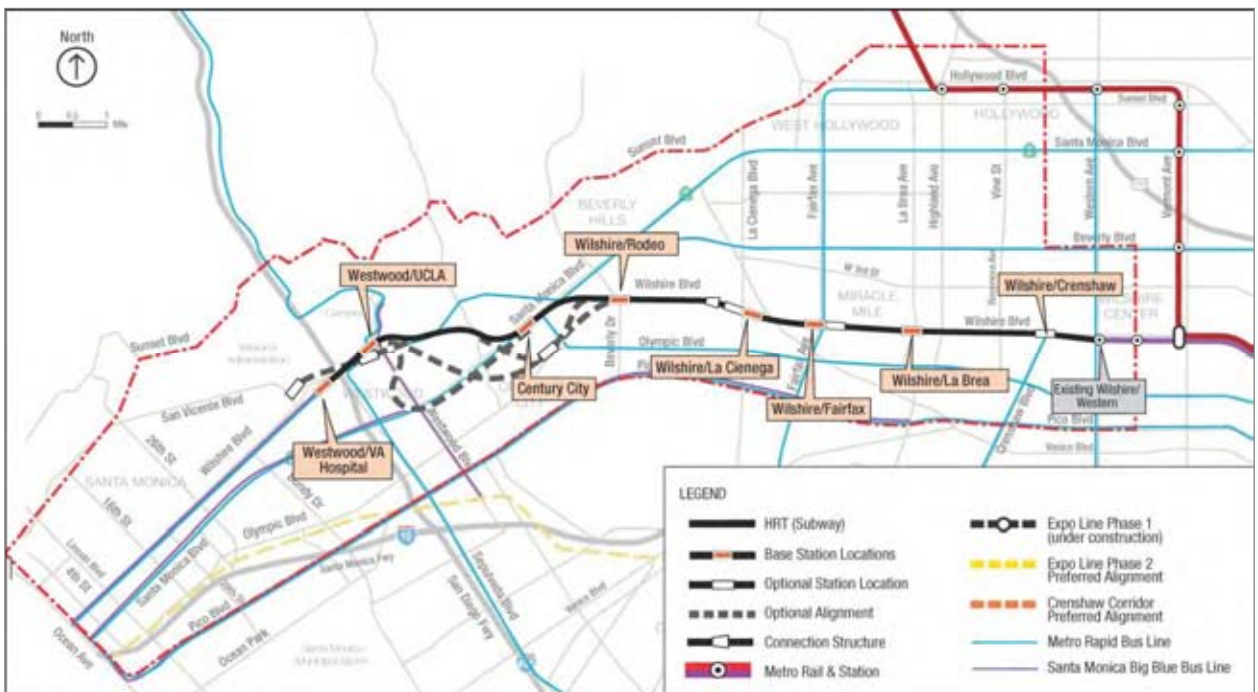


Figure 3-2. Alternative 2—Westwood/Veterans Administration (VA) Hospital Extension

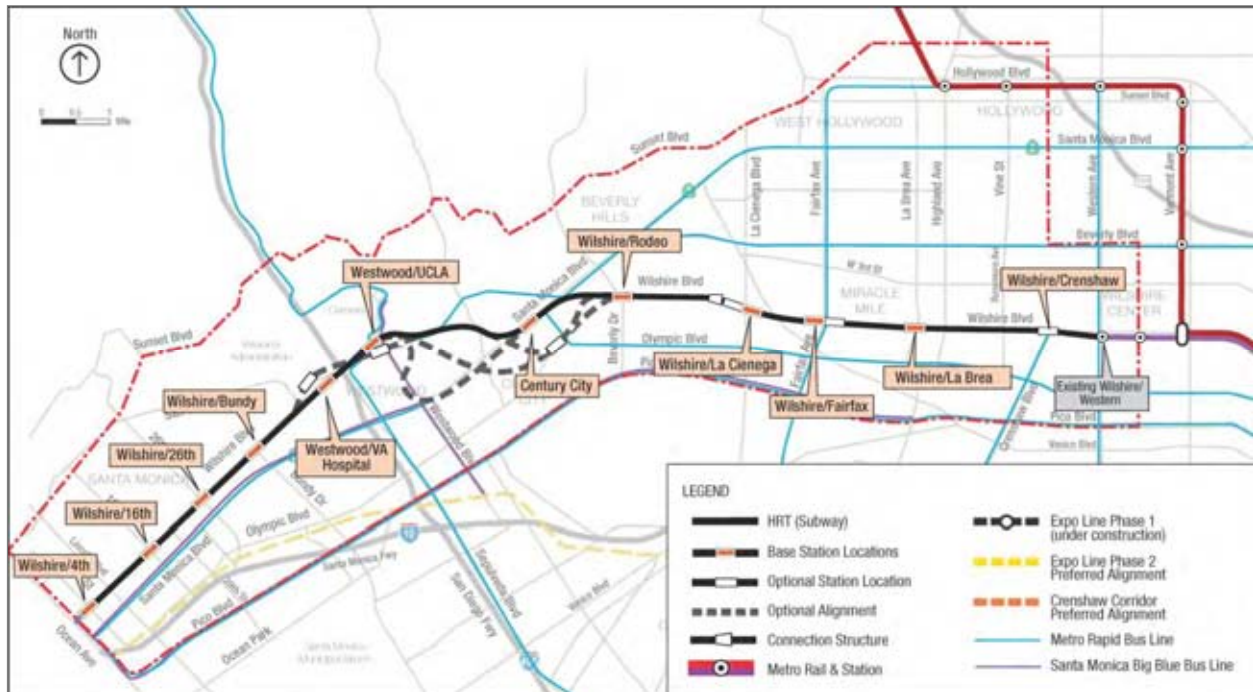


Figure 3-3. Alternative 3—Santa Monica Extension

3.3.4 Alternative 4—Westwood/VA Hospital Extension plus West Hollywood Extension

Similar to Alternative 2, Alternative 4 extends the existing Metro Purple Line from the Wilshire/Western Station to a Westwood/VA Hospital Station. Alternative 4 also includes a West Hollywood Extension that connects the existing Metro Red Line Hollywood/Highland Station to a track connection structure near Robertson and Wilshire Boulevards, west of the Wilshire/La Cienega Station (Figure 3-4). The alignment is 14.06 miles long.

Alternative 4 would operate from Wilshire/Western to a Westwood/VA Hospital Station in each direction at 3.3-minute headways during morning and evening peak periods and 10-minute headways during the midday off-peak period. The West Hollywood extension would operate at 5-minute headways during peak periods and 10-minute headways during the midday, off-peak period. The estimated one-way running time for the Metro Purple Line extension is 13 minutes 53 seconds, and the running time for the West Hollywood from Hollywood/Highland to Westwood/VA Hospital is 17 minutes and 2 seconds.

3.3.5 Alternative 5—Santa Monica Extension plus West Hollywood Extension

Similar to Alternative 3, Alternative 5 extends the existing Metro Purple Line from the Wilshire/Western Station to the Wilshire/4th Station and also adds a West Hollywood Extension similar to the extension described in Alternative 4 (Figure 3-5). The alignment is 17.49 miles in length. Alternative 5 would operate the Metro Purple Line extension in each direction at 3.3-minute headways during the morning and evening peak periods and 10-minute headways during the midday, off-peak period. The West Hollywood extension would operate in each direction at 5-minute headways during peak periods and 10-minute headways during the midday, off-peak period. The estimated one-way running time for the

Metro Purple Line extension is 19 minutes 27 seconds, and the running time from the Hollywood/Highland Station to the Wilshire/4th Station is 22 minutes 36 seconds.

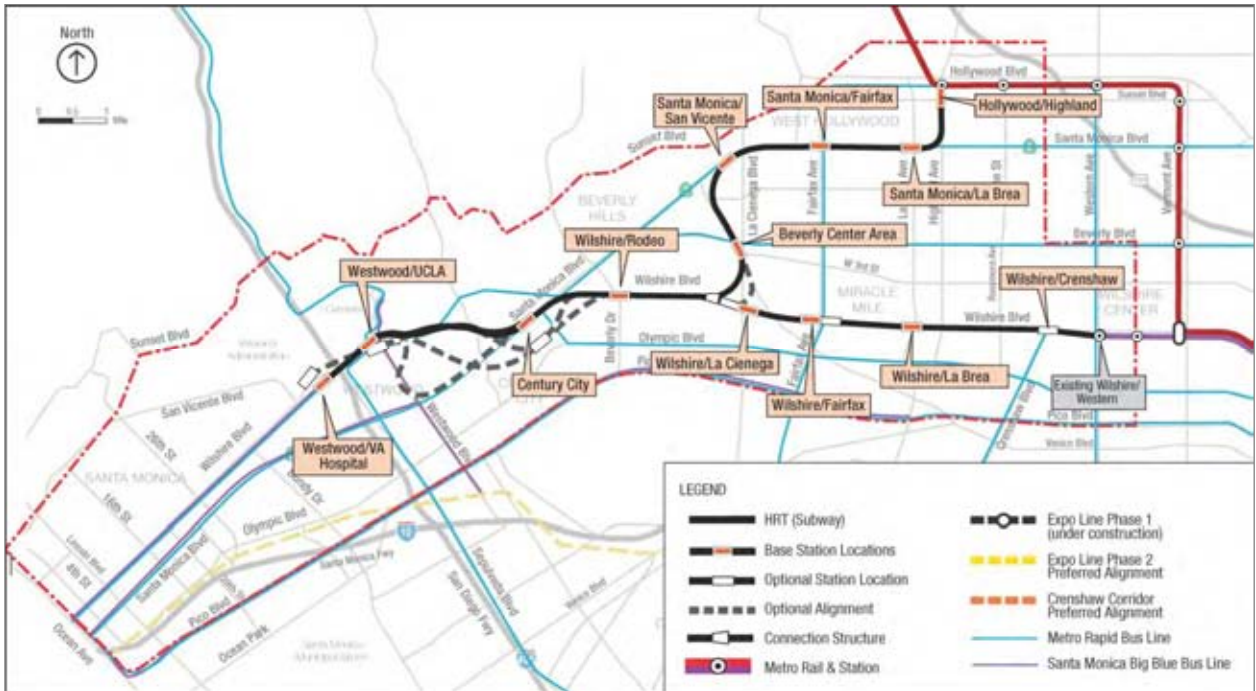


Figure 3-4. Alternative 4—Westwood/VA Hospital Extension plus West Hollywood Extension

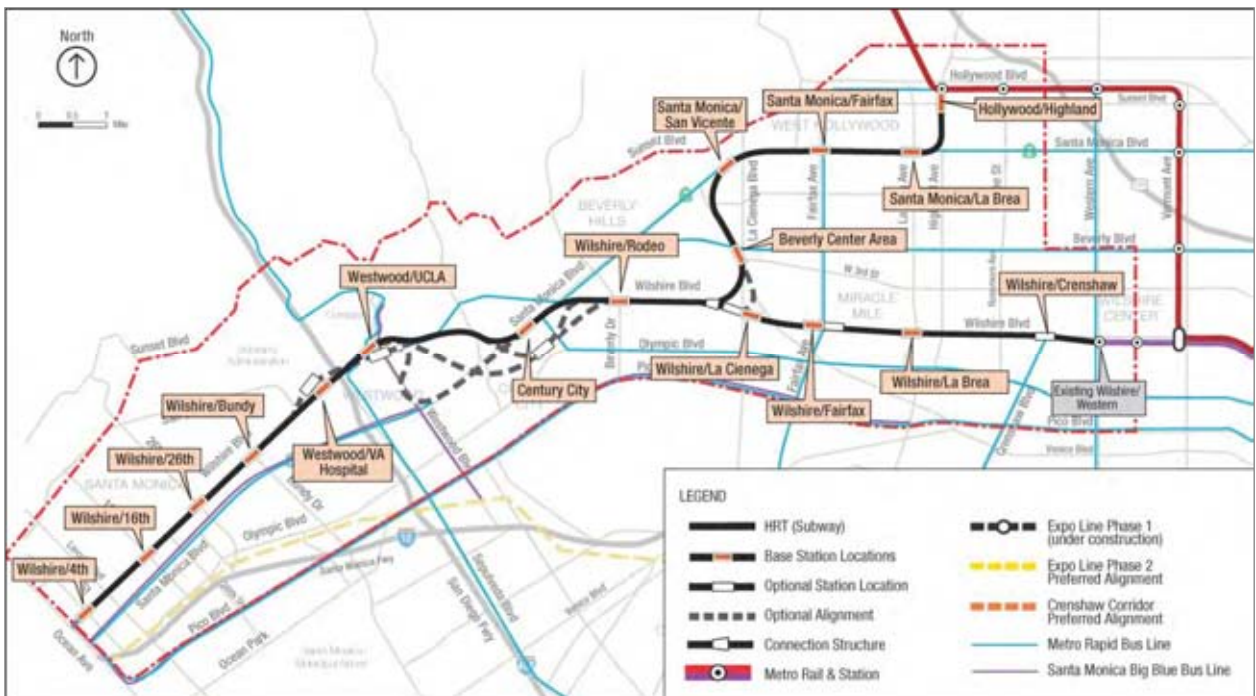


Figure 3-5. Alternative 5—Santa Monica Extension plus West Hollywood Extension



3.4 Stations and Segment Options

HRT stations consist of a station “box,” or area in which the basic components are located. The station box can be accessed from street-level entrances by stairs, escalators, and elevators that would bring patrons to a mezzanine level where the ticketing functions are located. The 450-foot platforms are one level below the mezzanine level and allow level boarding (i.e., the train car floor is at the same level as the platform). Stations consist of a center or side platform. Each station is equipped with under-platform exhaust shafts, over-track exhaust shafts, blast relief shafts, and fresh air intakes. In most stations, it is anticipated that only one portal would be constructed as part of the Project, but additional portals could be developed as a part of station area development (by others). Stations and station entrances would comply with the *Americans with Disabilities Act of 1990*, Title 24 of the California Code of Regulations, the California Building Code, and the Department of Transportation Subpart C of Section 49 CFR Part 37.

Platforms would be well-lighted and include seating, trash receptacles, artwork, signage, safety and security equipment (closed-circuit television, public announcement system, passenger assistance telephones), and a transit passenger information system. The fare collection area includes ticket vending machines, fare gates, and map cases.

Table 3-1 lists the stations and station options evaluated and the alternatives to which they are applicable. Figure 3-6 shows the proposed station and alignment options. These include:

- Option 1—Wilshire/Crenshaw Station Option
- Option 2—Fairfax Station Option
- Option 3—La Cienega Station Option
- Option 4—Century City Station and Alignment Options
- Option 5—Westwood/UCLA Station Option
- Option 6—Westwood/VA Hospital Station Option

Table 3-1. Alternatives and Stations Considered

Stations	Alternatives				
	1	2	3	4	5
	Westwood/ UCLA Extension	Westwood/ VA Hospital Extension	Santa Monica Extension	Westwood/ VA Hospital Extension Plus West Hollywood Extension	Santa Monica Extension Plus West Hollywood Extension
Base Stations					
Wilshire/Crenshaw	•	•	•	•	•
Wilshire/La Brea	•	•	•	•	•
Wilshire/Fairfax	•	•	•	•	•
Wilshire/La Cienega	•	•	•	•	•
Wilshire/Rodeo	•	•	•	•	•
Century City (Santa Monica Blvd)	•	•	•	•	•
Westwood/UCLA (Off-street)	•	•	•	•	•
Westwood/VA Hospital		•	•	•	•
Wilshire/Bundy			•		•
Wilshire/26th			•		•
Wilshire/16th			•		•
Wilshire/4th			•		•
Hollywood/Highland				•	•
Santa Monica/La Brea				•	•
Santa Monica/Fairfax				•	•
Santa Monica/San Vicente				•	•
Beverly Center Area				•	•
Station Options					
1—No Wilshire/Crenshaw	•	•	•	•	•
2—Wilshire/Fairfax East	•	•	•	•	•
3—Wilshire/La Cienega (Transfer Station)	•	•	•	•	•
4—Century City (Constellation Blvd)	•	•	•	•	•
5—Westwood/UCLA (On-street)	•	•	•	•	•
6—Westwood/VA Hospital North		•	•	•	•

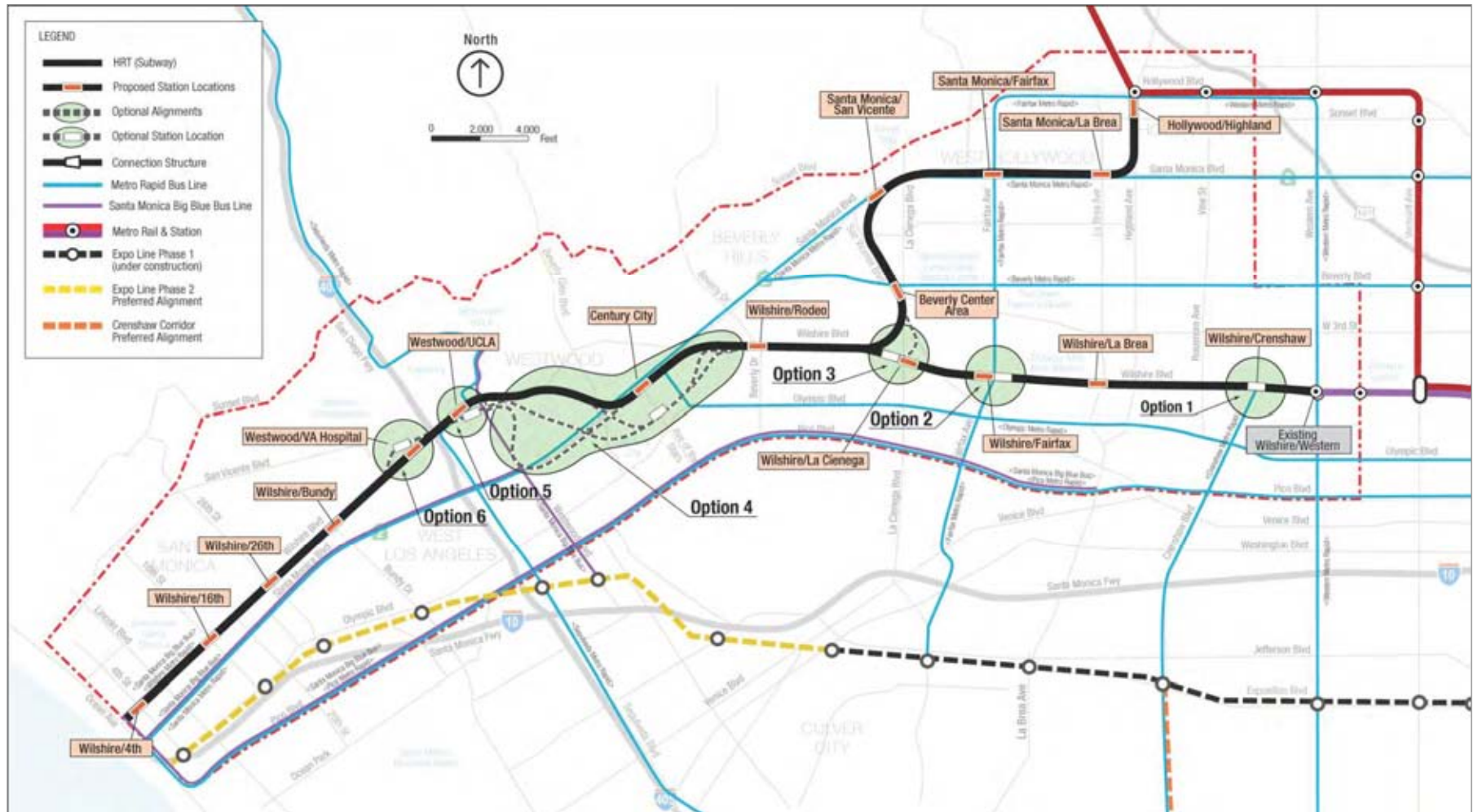


Figure 3-6. Station and Alignment Options



3.4.1 Option 1—Wilshire/Crenshaw Station Option

- Base Station: Wilshire/Crenshaw Station—The base station straddles Crenshaw Boulevard, between Bronson Avenue and Lorraine Boulevard.
- Station Option: Remove Wilshire/Crenshaw Station—This station option would delete the Wilshire/Crenshaw Station. Trains would run from the Wilshire/Western Station to the Wilshire/La Brea Station without stopping at Crenshaw. A vent shaft would be constructed at the intersection of Western Avenue and Wilshire Boulevard (Figure 3-7).

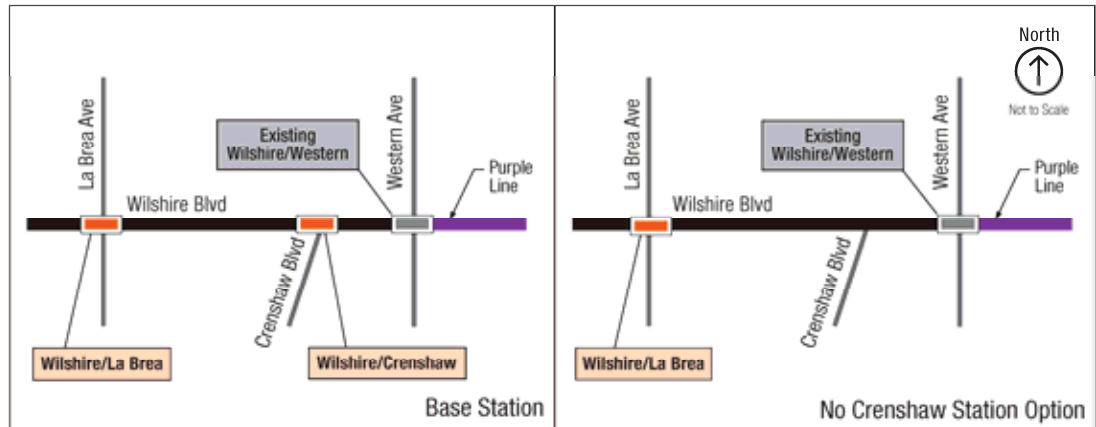


Figure 3-7. Option 1—No Wilshire/Crenshaw Station Option

3.4.2 Option 2—Wilshire/Fairfax Station East Option

- Base Station: Wilshire/Fairfax Station—The base station is under the center of Wilshire Boulevard, immediately west of Fairfax Avenue.
- Station Option: Wilshire/Fairfax Station East Station Option—This station option would locate the Wilshire/Fairfax Station farther east, with the station underneath the Wilshire/Fairfax intersection (Figure 3-8). The east end of the station box would be east of Orange Grove Avenue in front of LACMA, and the west end would be west of Fairfax Avenue.

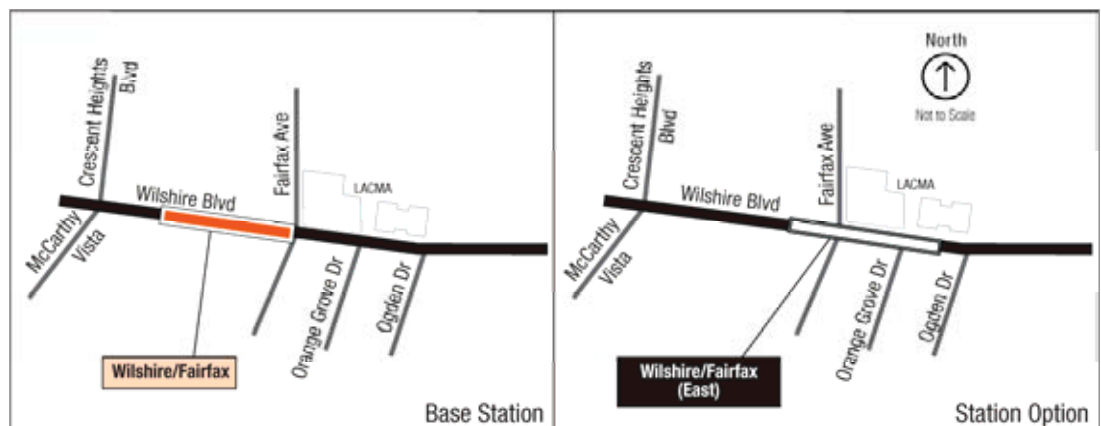


Figure 3-8. Option 2—Fairfax Station Option

3.4.3 Option 3—Wilshire/La Cienega Station Option

- **Base Station: Wilshire/La Cienega Station**—The base station would be under the center of Wilshire Boulevard, immediately east of La Cienega Boulevard. A direct transfer between the Metro Purple Line and the potential future West Hollywood Line is not provided with this station. Instead, a connection structure is proposed west of Robertson Boulevard as a means to provide a future HRT connection to the West Hollywood Line.
- **Station Option: Wilshire/La Cienega Station West with Connection Structure**—The station option would be located west of La Cienega Boulevard, with the station box extending from the Wilshire/Le Doux Road intersection to just west of the Wilshire/Carson Road intersection (Figure 3-9). It also contains an alignment option that would provide an alternate HRT connection to the future West Hollywood Extension. This alignment portion of Option 3 is only applicable to Alternatives 4 and 5.

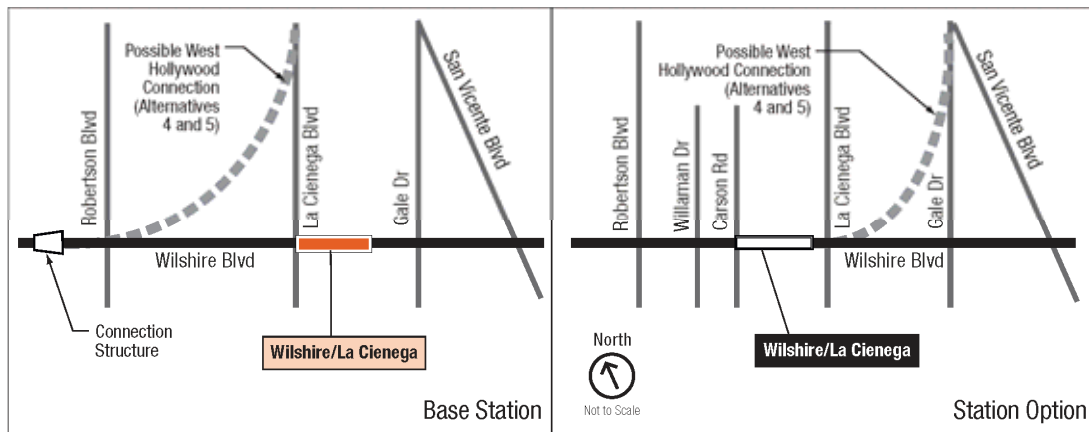


Figure 3-9. Option 3—La Cienega Station Option

3.4.4 Option 4—Century City Station and Segment Options

3.4.4.1 Century City Station and Beverly Hills to Century City Segment Options

- **Base Station: Century City (Santa Monica) Station**—The base station would be under Santa Monica Boulevard, centered on Avenue of the Stars.
- **Station Option: Century City (Constellation) Station**—With Option 4, the Century City Station has a location option on Constellation Boulevard (Figure 3-10), straddling Avenue of the Stars and extending westward to east of MGM Drive.
- **Segment Options**—Three route options are proposed to connect the Wilshire/Rodeo Station to Century City (Constellation) Station: Constellation North and Constellation South. As shown in Figure 3-10, the base segment to the base Century City (Santa Monica) Station is shown in the solid black line and the segment options to Century City (Constellation) Station are shown in the dashed grey lines.

3.4.4.2 Century City to Westwood Segment Options

Three route options considered for connecting the Century City and Westwood stations include: East, Central, and West. As shown in Figure 3-10, each of these three segments would be accessed from both Century City Stations and both Westwood/UCLA Stations. The base segment is shown in the solid black line and the options are shown in the dashed grey lines.

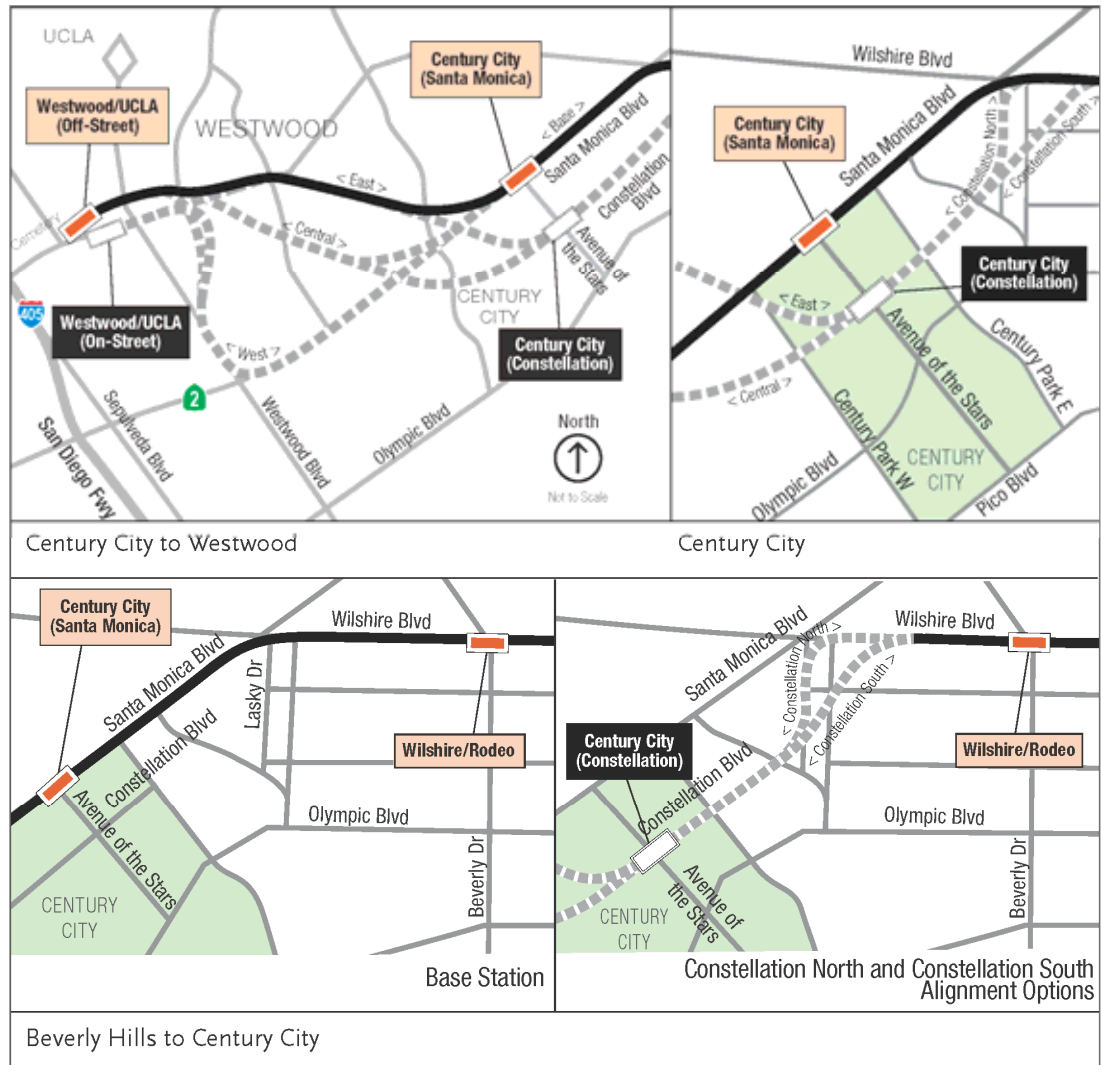


Figure 3-10. Century City Station Options

3.4.5 Option 5—Westwood/UCLA Station Options

- **Base Station: Westwood/UCLA Station Off-Street Station Option**—The base station is located under the UCLA Lot 36 on the north side of Wilshire Boulevard between Gayley and Veteran Avenues.
- **Station Option: Westwood/UCLA On-Street Station Option**—This station option would be located under the center of Wilshire Boulevard, immediately west of Westwood Boulevard (Figure 3-11).

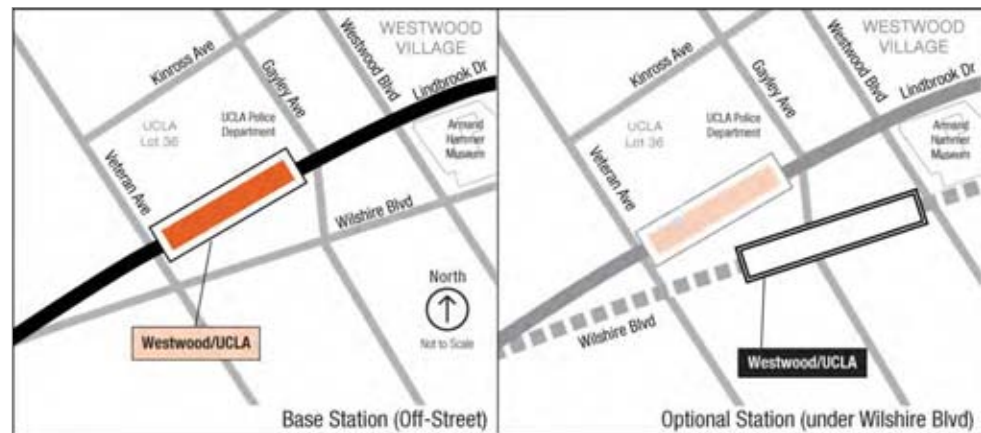


Figure 3-11. Option 5—Westwood/UCLA Station Options

3.4.6 Option 6—Westwood/VA Hospital Station Option

- **Base Station: Westwood/VA Hospital**—The base station would be below the VA Hospital parking lot on the south side of Wilshire Boulevard in between the I-405 exit ramp and Bonsall Avenue.
- **Station Option: Westwood/VA Hospital North Station**—This station option would locate the Westwood/VA Hospital Station on the north side of Wilshire Boulevard between Bonsall Avenue and Wadsworth Theater. (Shown in Figure 3-12)

To access the Westwood/VA Hospital Station North, the alignment would extend westerly from the Westwood/UCLA Station under Veteran Avenue, the Federal Building property, the I-405 Freeway, and under the Veterans Administration property just east of Bonsall Avenue.

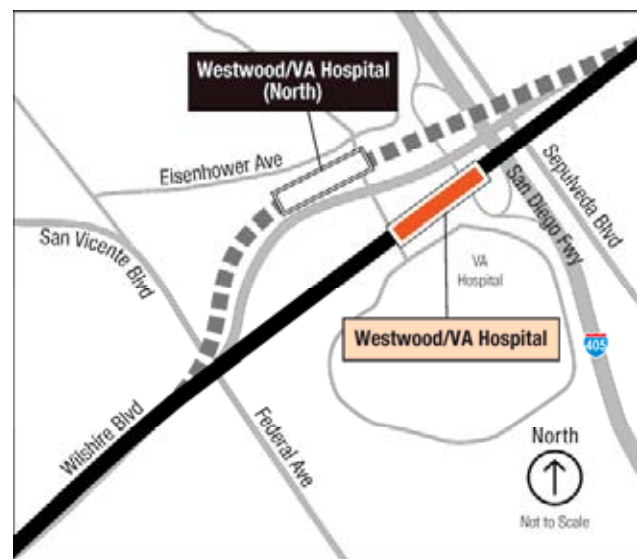


Figure 3-12. Option 6—Westwood/VA Hospital Station North

3.5 Base Stations

The remaining stations (those without options) are described below.

- **Wilshire/La Brea Station**—This station would be located between La Brea and Cloverdale Avenues.
- **Wilshire/Rodeo Station**—This station would be under the center of Wilshire Boulevard, beginning just west of South Canon Drive and extending to El Camino Drive.



- Wilshire/Bundy Station—This station would be under Wilshire Boulevard, east of Bundy Drive, extending just east of Saltair Avenue.
- Wilshire/26th Station—This station would be under Wilshire Boulevard, with the eastern end east of 26th Street and the western end west of 25th Street, midway between 25th Street and Chelsea Avenue.
- Wilshire/16th Station—This station would be under Wilshire Boulevard with the eastern end just west of 16th Street and the western end west of 15th Street.
- Wilshire/4th Station—This station would be under Wilshire Boulevard and 4th Street in Santa Monica.
- Hollywood/Highland Station—This station would be located under Highland Avenue and would provide a transfer option to the existing Metro Red Line Hollywood/Highland Station under Hollywood Boulevard.
- Santa Monica/La Brea Station—This station would be under Santa Monica Boulevard, just west of La Brea Avenue, and would extend westward to the center of the Santa Monica Boulevard/Formosa Avenue.
- Santa Monica/Fairfax Station—This station is under Santa Monica Boulevard and would extend from just east of Fairfax Avenue to just east of Ogden Drive.
- Santa Monica/San Vicente Station—This station would be under Santa Monica Boulevard and would extend from just west of Hancock Avenue on the west to just east of Westmount Drive on the east.
- Beverly Center Area Station—This station would be under San Vicente Boulevard, extending from just south of Gracie Allen Drive to south of 3rd Street.

3.6 Other Components of the Build Alternatives

3.6.1 Traction Power Substations

Traction power substations (TPSS) are required to provide traction power for the HRT system. Substations would be located in the station box or in a box located with the crossover tracks and would be located in a room that is about 50 feet by 100 feet in a below grade structure.

3.6.2 Emergency Generators

Stations at which the emergency generators would be located are Wilshire/La Brea, Wilshire/La Cienega, Westwood/UCLA, Westwood/VA Hospital, Wilshire/26th, Highland/Hollywood, Santa Monica/La Brea, and Santa Monica/San Vicente. The emergency generators would require approximately 50 feet by 100 feet of property in an off-street location. All would require property acquisition, except for the one at the Wilshire/La Brea Station which uses Metro's property.

3.6.3 Mid-Tunnel Vent Shaft

Each alternative would require mid-tunnel ventilation shafts. The vent shafts are emergency ventilation shafts with dampers, fans, and sound attenuators generally placed at both ends of a station box to exhaust smoke. In addition, emergency vent shafts could be used for station



cooling and gas mitigation. The vent shafts are also required in tunnel segments with more than 6,000 feet between stations to meet fire/life safety requirements. There would be a connecting corridor between the two tunnels (one for each direction of train movement) to provide emergency egress and fire-fighting ingress. A vent shaft is approximately 150 square feet; with the opening of the shaft located in a sidewalk and covered with a grate about 200 square feet.

Table 3-2. Mid-Tunnel Vent Shaft Locations

Alternative/Option	Location
Alternatives 1 through 5, MOS 2	Part of the connection structure on Wilshire Boulevard, west of Robertson Boulevard
Alternatives 2 through 5	West of the Westwood/VA Hospital Station on Army Reserve property at Federal Avenue and Wilshire Boulevard
Option 4 via East route	At Wilshire Boulevard/Manning Avenue intersection
Option 4 to Westwood/UCLA Off-Street Station via Central route	On Santa Monica Boulevard just west of Beverly Glen Boulevard
Option 4 to Westwood/UCLA On-Street Station via Central route	At Santa Monica Boulevard/Beverly Glen Boulevard intersection
Options 4 via West route	At Santa Monica Boulevard/Glendon Avenue intersection
Options 4 from Constellation Station via Central route	On Santa Monica Boulevard between Thayer and Pandora Avenues
Option from Constellation Station via West route	On Santa Monica Boulevard just east of Glendon Avenue

3.6.4 Trackwork Options

Each Build Alternative requires special trackwork for operational efficiency and safety (Table 2-3):

- Tail tracks—a track, or tracks, that extends beyond a terminal station (the last station on a line)
- Pocket tracks—an additional track, or tracks, adjacent to the mainline tracks generally at terminal stations
- Crossovers—a pair of turnouts that connect two parallel rail tracks, allowing a train on one track to cross over to the other
- Double crossovers—when two sets of crossovers are installed with a diamond allowing trains to cross over to another track

Table 3-3. Special Trackwork Locations

Station	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	Westwood/ UCLA Extension	Westwood/ VA Hospital Extension	Santa Monica Extension	Westwood/VA Hospital Extension Plus West Hollywood Extension	Santa Monica Extension Plus West Hollywood Extension
Special Trackwork Locations—Base Trackwork Alternatives					
Wilshire/Crenshaw	None	None	None	None	None
Wilshire/La Brea	Double Crossover	Double Crossover	Double Crossover	Double Crossover	Double Crossover
Wilshire/Fairfax	None <i>MOS 1 Only; Terminus Station with Tail tracks</i>	None <i>MOS 1 Only; Terminus Station with Tail tracks</i>	None <i>MOS 1 Only; Terminus Station with Tail tracks</i>	None <i>MOS 1 Only; Terminus Station with Tail tracks</i>	None <i>MOS 1 Only; Terminus Station with Tail tracks</i>
Wilshire/La Cienega	None	None	None	None	None
<i>Station Option 3 - Wilshire/La Cienega West</i>	Turnouts	Turnouts	Turnouts		
Wilshire/Robertson Connection Structure	Equilateral Turnouts—for future West Hollywood connection	Equilateral Turnouts—for future West Hollywood connection	Equilateral Turnouts—for future West Hollywood connection	Equilateral Turnouts	Equilateral Turnouts
Wilshire/Rodeo	None	None	None	None	None
Century City	Double Crossover <i>MOS 2 Only; Terminus Station with Double Crossover and tail tracks</i>	Double Crossover <i>MOS 2 Only; Terminus Station with Double Crossover and tail tracks</i>	Double Crossover <i>MOS 2 Only; Terminus Station with Double Crossover and tail tracks</i>	Double Crossover <i>MOS 2 Only; Terminus Station with Double Crossover and tail tracks</i>	Double Crossover <i>MOS 2 Only; Terminus Station with Double Crossover and tail tracks</i>
Westwood/UCLA	End Terminal with Double Crossover and tail tracks	Double Crossover	Double Crossover	Double Crossover	Double Crossover
Westwood/VA Hospital	N/A	End Terminal with Turnouts and tail tracks	Turnouts	End Terminal with Turnouts and tail tracks	Turnouts
Wilshire/Bundy	N/A	N/A	None	N/A	None
Wilshire/26th	N/A	N/A	None	N/A	None
Wilshire/16th	N/A	N/A	None	N/A	None
Wilshire/4th	N/A	N/A	End Terminal with Double Crossover. Pocket Track with Double Crossover, Equilateral Turnouts and tail tracks	N/A	End Terminal with Double Crossover, Pocket Track with Double Crossover, Equilateral Turnouts and tail tracks
Hollywood/ Highland	N/A	N/A	N/A	Double Crossover and tail tracks	Double Crossover and tail tracks
Santa Monica/La Brea	N/A	N/A	N/A	None	None
Santa Monica/Fairfax	N/A	N/A	N/A	None	None
Santa Monica/ San Vicente	N/A	N/A	N/A	Double Crossover	Double Crossover
Beverly Center	N/A	N/A	N/A	None	None
Additional Special Trackwork Location (Optional Trackwork)					
Wilshire/Fairfax	Double Crossover	Double Crossover	Double Crossover	Double Crossover	Double Crossover
Wilshire/La Cienega	Double Crossover	Double Crossover	Double Crossover	Double Crossover	Double Crossover
Wilshire/ Rodeo	Pocket Track	Pocket Track	Pocket Track	Pocket Track	Pocket Track
Wilshire/26th	N/A	N/A	Double Crossover	N/A	Double Crossover

3.6.5 Rail Operations Center

The existing Rail Operations Center (ROC), shown on the figure below, located in Los Angeles near the intersection of Imperial Highway and the Metro Blue Line does not have sufficient room to accommodate the new transit corridors and line extensions in Metro’s expansion program. The Build Alternatives assume an expanded ROC at this location.

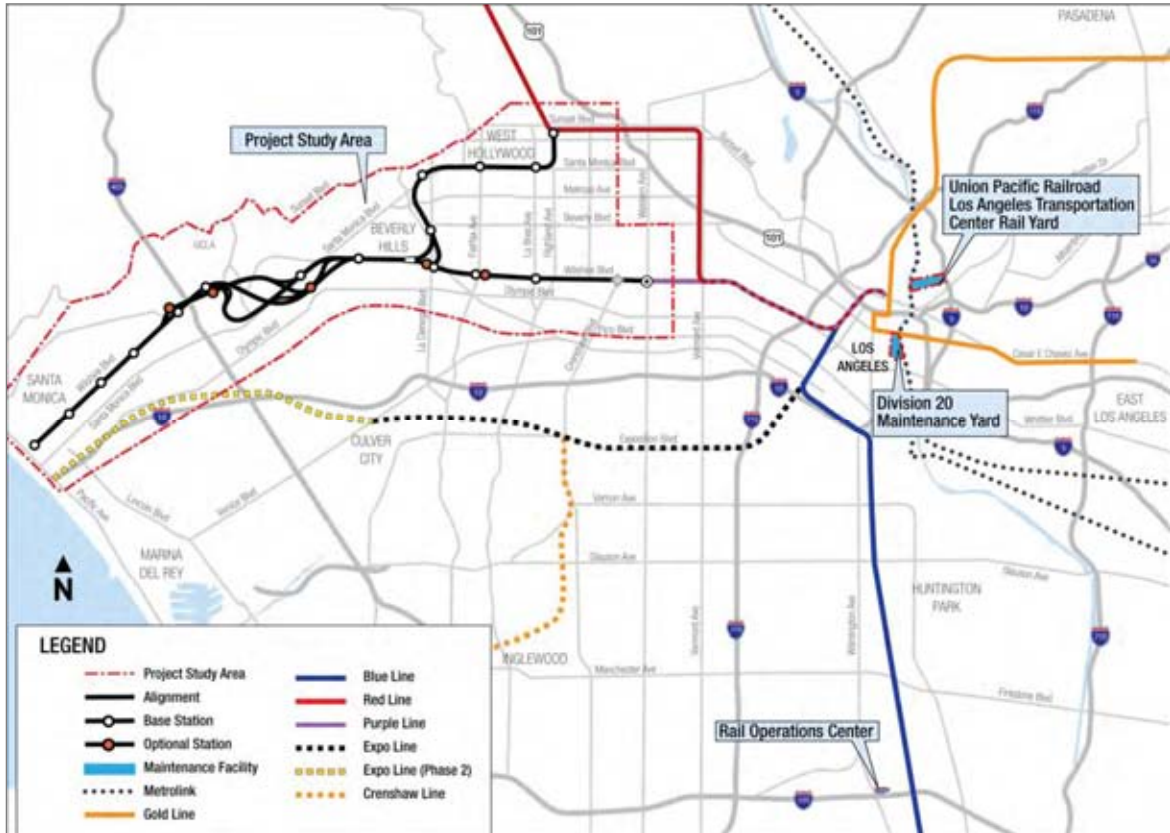


Figure 3-13. Location of the Rail Operations Center and Maintenance Yards

3.6.6 Maintenance Yards

If any of the Build Alternatives are chosen, additional storage capacity would be needed. Two options for providing this expanded capacity are as follows:

- The first option requires purchasing 3.9 acres of vacant private property abutting the southern boundary of the Division 20 Maintenance and Storage Facility, which is located between the 4th and 6th Street Bridges. Additional maintenance and storage tracks would accommodate up to 102 vehicles, sufficient for Alternatives 1 and 2.
- The second option is a satellite facility at the Union Pacific (UP) Los Angeles Transportation Center Rail Yard. This site would be sufficient to accommodate the vehicle fleet for all five Build Alternatives. An additional 1.3 miles of yard lead tracks from the Division 20 Maintenance and Storage Facility and a new bridge over the Los Angeles River would be constructed to reach this yard (Figure 3-15).



Figure 3-14. Maintenance Yard Options



Figure 3-15. UP Railroad Rail Bridge

3.7 Minimum Operable Segments

Due to funding constraints, it may be necessary to construct the Westside Subway Extension in shorter segments. A Minimum Operable Segment (MOS) is a phasing option that could be applied to any of the Build Alternatives.

3.7.1 MOS 1—Fairfax Extension

MOS 1 follows the same alignment as Alternative 1, but terminates at the Wilshire/Fairfax Station rather than extending to a Westwood/UCLA Station. A double crossover for MOS 1 is located on the west end of the Wilshire/La Brea Station box, west of Cloverdale Avenue. The alignment is 3.10 miles in length.

3.7.2 MOS 2—Century City Extension

MOS 2 follows the same alignment as Alternative 1, but terminates at a Century City Station rather than extending to a Westwood/UCLA Station. The alignment is 6.61 miles from the Wilshire/Western Station.