



CRENSHAW TRANSIT CORRIDOR PROJECT

Project No. PS-4330-1968

Final Feasibility Study – Wilshire/La Brea Light Rail Transit Extension



Prepared for:



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Final Feasibility Study – Wilshire/La Brea Light Rail Transit Extension

Crenshaw Transit Corridor Project PS-4330-1968

Prepared for:
Los Angeles County
Metropolitan Transportation Authority

Prepared by:
PB

May 2009

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1.0 INTRODUCTION

The Los Angeles County Metropolitan Transportation Authority (Metro) has initiated an Alternatives Analysis (AA) and the preparation of an Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the Crenshaw Transit Corridor. Metro is serving as the lead agency for purposes of the California Environmental Quality Act (CEQA) environmental clearance, and the Federal Transit Administration (FTA) is serving as lead agency for purposes of the National Environmental Policy Act (NEPA).

1.1 Background to the Study

Metro is planning transit improvements in the Crenshaw Transit Corridor and is conducting an AA/DEIS/DEIR to determine a preferred transit mode and alignment for the improvements. This effort is a continuation of previous planning studies, including the *Crenshaw-Prairie Corridor Major Investment Study (MIS)*, which was completed in 2003.

Since 2003, Metro has implemented several new Metro Rapid bus (BRT) routes within the corridor to supplement its local bus services, providing new options for travel in both north-south and east-west directions. This new service has helped to accommodate some of the demand for improved transit, but additional transit improvements are needed as bus service within the corridor continues to operate at or over capacity conditions.

With construction of the Exposition (Expo) Light Rail Transit (LRT) line underway, the Crenshaw Transit Corridor is viewed as a possible new north – south service linking the Crenshaw Corridor, Inglewood, Los Angeles International Airport (LAX), and the South Bay with transfer connections to Downtown Los Angeles and the Westside.

There are other travel patterns and regional connections that must be considered including connections to the planned extension of the Metro Purple Line on Wilshire Boulevard, to the Metro Green Line, and to options being considered based on the *Harbor Subdivision Technical Feasibility Analysis* (January 2007). There are also local transit service needs between and within the corridor Cities of Los Angeles, Inglewood, Hawthorne, and El Segundo, and portions of unincorporated Los Angeles County that must be considered in developing transit alternatives.

1.2 Study Area

The study area for the Crenshaw Transit Corridor extends approximately 10 miles, from Wilshire Boulevard on the north to El Segundo Boulevard on the south, as shown in Figure 1-1.

The study area is north-south oriented and includes portions of five local government jurisdictions: the Cities of Los Angeles, Inglewood, Hawthorne, El Segundo, as well as portions of unincorporated Los Angeles County, California. The study area is generally defined as the area extending north to Wilshire Boulevard, east to Arlington Avenue, south to El Segundo Boulevard, and west to Sepulveda Boulevard, La Tijera Boulevard, and La Brea Avenue.



Figure 1-1. Study Area



Source: Parsons Brinckerhoff, 2008

CRENSHAW TRANSIT CORRIDOR PROJECT



A variety of land uses exist within the study area, including: single- and multi-family residences and commercial uses north of the Interstate 10 (I-10) Freeway and south of Slauson Avenue; commercial uses along Crenshaw Boulevard and in Hawthorne; industrial and public land uses in Inglewood and El Segundo; and, redevelopment areas in Los Angeles, Inglewood, and Hawthorne.

1.3 Screening Process Summary

The *Alternatives Screening Report* was prepared in June 2008. The report described the results of the screening of transit alternatives developed during scoping for the Crenshaw Transit Corridor Project and the conceptual alternatives recommended for further study and evaluation in the AA/DEIS/DEIR. In addition to the No-Build Alternative selected for further study, the report included a Transportation Systems Management (TSM) Alternative, a BRT Alternative, and a LRT Alternative.

This detailed definition of alternatives was the second of three steps in the development of alternatives. The first step is the conceptual definition of alternatives. The conceptual alternatives were described in the report, *Conceptual Alternatives for Screening Report*, March 2008. This detailed definition of alternatives describes the physical, operating, and policy assumptions developed for each alternative, in sufficient detail, for use in the engineering, environmental, travel forecasting, and financial technical analyses.

The next step was the final definition of alternatives. The final definition of alternatives was prepared after the screening process was completed, and reflected refinements made as a result of the screening. The final definition of alternatives included plan and profile drawings. It provides the basis for the description of alternatives in Chapter 2 – Alternatives considered in the AA/DEIS/DEIR document. The AA/DEIS/DEIR document covers a BRT alternative that operates between Wilshire/Western and Aviation/Imperial which could be rerouted to Wilshire/La Brea when the Metro Purple Line (Westside Line) is extended. The LRT Alternative operates between Crenshaw/Exposition Boulevard and El Segundo.

In the *Alternatives Screening Report* for the AA/DEIS/DEIR, a future extension to the north and west in the direction the Wilshire Boulevard/La Brea Avenue intersection was recommended to be studied further to establish the potential of such an extension. Analysis of ridership and travel time benefits found that such an extension would produce similar benefits as an extension of the Crenshaw Transit Corridor to Downtown Los Angeles via the Exposition Line. Extension in the direction of Wilshire/La Brea, however, would provide a new connection and would connect to the Wilshire Corridor, an important activity center and an important transit connection.

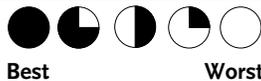
Furthermore, a connection in the direction of Wilshire/La Brea provides other advantages over a potential connection via Crenshaw Boulevard directly to Wilshire/Crenshaw, another potential connection point to the Wilshire Corridor. Extensions in the direction of Wilshire/La Brea demonstrate higher ridership and would facilitate local transfer connections to the Westside and Hollywood. In addition, an extension in the direction of Wilshire/La Brea could allow for a future extension toward



Hollywood or West Hollywood. Table 1-1 provides a comparison of extensions to Wilshire/La Brea and Wilshire/Crenshaw.

Table 1-1. Comparison of Benefits between Wilshire/La Brea and Wilshire/Crenshaw Extension

Benefits	Wilshire/La Brea	Wilshire/Crenshaw
Compatible Land Uses/Plans		
Potential Connections to Downtown Los Angeles		
Potential Connections to Westside		
Cost-Effectiveness		



1.4 Purpose

The purpose of this feasibility study is to describe a possible future extension to the Base LRT Alternative, which is currently defined to extend from the Metro Green Line in the South to a connection at the Exposition Line at Exposition and Crenshaw Boulevards. This northern segment would be a future extension to the proposed LRT alignment under the Base LRT Alternative under evaluation in the AA/DEIS/DEIR, and would allow for transfer to the extension of the planned Metro Purple Line.

The LRT alignment under the Base LRT Alternative for the Crenshaw Transit Corridor Project begins at the Metro Green Line west of the existing Aviation/LAX Station, proceeds north along the Harbor Subdivision right-of-way to Crenshaw Boulevard, and then follows Crenshaw Boulevard north to Exposition Boulevard, terminating at the Metro Expo LRT line (under construction) Crenshaw/Exposition Station. From south of Vernon Avenue to north of the planned Metro Crenshaw Line Crenshaw/Martin Luther King Jr. Station, the alignment would operate in a below-grade configuration. The alignment would then ascend to the street surface and operate in an at-grade configuration for the remaining distance to the Metro Expo LRT Line (under construction) Crenshaw/Exposition Station. There is a design option under evaluation in the AA/DEIS/DEIR that provides for an alternative below-grade alignment configuration continuing from the planned Metro Crenshaw Line Crenshaw/Martin Luther King Jr. Station to the Expo LRT Line with a below-grade station on Crenshaw just south of Exposition Boulevard.

An extension toward Wilshire/La Brea may involve significant sections of grade-separated operation. A below-grade extension could begin in two locations based on the grade of the Crenshaw/Exposition Station. First, under the Base LRT Alignment, where the Crenshaw/Exposition Station is at-grade, the potential Northern LRT alignment would need to begin from the planned below grade Crenshaw/Martin Luther King Jr. Station to the Wilshire /La Brea Station. This scenario would require the construction of a new below-grade Crenshaw/Exposition Station. Under the second scenario, where the LRT Alternative is below-grade at the Crenshaw / Exposition Station, the northern alignment extension could begin immediately north of the Crenshaw/Exposition Station.



This report provides a summary of the results of the study of the potential future LRT extension to Wilshire Boulevard and La Brea Avenue or other connections to the west. While this discussion focuses on a connection toward Wilshire / La Brea, this discussion is intended to apply more broadly to other potential connections with the Wilshire corridor, including potential connections toward the west at Wilshire/Fairfax, Wilshire/La Cienega, and Wilshire/San Vicente. These potential future connections and the extensions associated with them could benefit from and be advanced by the infrastructure explored within this report.

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2.0 DESCRIPTION OF WILSHIRE/LA BREA LIGHT RAIL TRANSIT EXTENSION

This chapter describes the proposed alignment and station locations for the Wilshire/La Brea LRT extension from the planned Metro Crenshaw Line Crenshaw/Martin Luther King Jr. Station to Wilshire/La Brea. Wilshire/La Brea could serve as a future terminus for an extension north from the Metro Expo LRT Line to Wilshire Boulevard, a distance of approximately 3.5 miles. Other possible termini include Wilshire/San Vicente, Wilshire/La Cienega and Wilshire/Fairfax although these possible termini would increase the length of a LRT extension. Ridership analyses performed for previous studies including the Westside AA Study indicate that feasible connections to stations west of La Brea would have the potential for even higher ridership (50 percent to 75 percent higher) than a connection at Wilshire/Crenshaw. Of the potential termini for travel from the Crenshaw Corridor to west Los Angeles, which is a primary destination for transit trips from the study area, the Wilshire/La Brea terminus is considered to be a good representation of a practical future connection to the planned future extension of the Metro Purple Line along Wilshire Boulevard west from its current terminus at the Metro Purple Line Wilshire/Western Station. Further study could be performed in the future to determine the most appropriate terminus on Wilshire Boulevard, which could include potential termini locations at Wilshire/San Vicente, Wilshire/La Cienega or Wilshire/Fairfax.

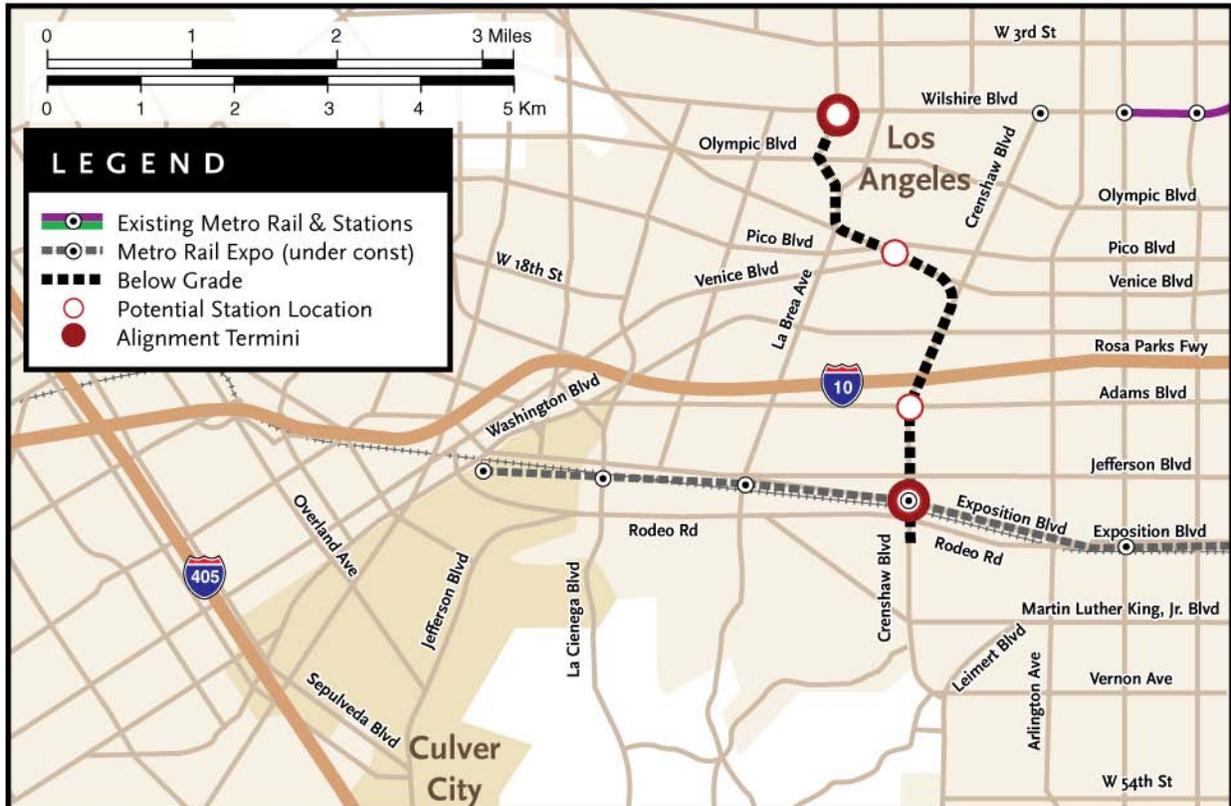
Figure 2-1 shows the proposed LRT and station locations for the Wilshire/La Brea extension. Conceptual alignment drawings for the alignment are presented in Appendix A. A profile of the alignment is presented in Appendix B. The proposed alignment is described by segment from south to north:

- Between the planned Metro Crenshaw Line Crenshaw/Martin Luther King Jr. Station to Exposition Boulevard (required if the Exposition / Crenshaw Station is at-grade, but is not required if the Exposition/Crenshaw Station is below grade)
- Exposition Boulevard to Adams Boulevard
- Adams Boulevard to Pico/San Vicente Boulevards
- Pico/San Vicente Boulevards to San Vicente Boulevard/La Brea Avenue
- San Vicente Boulevard/La Brea Avenue to Wilshire Boulevard/La Brea Avenue

2.1 Description of Alignment

2.1.1 Crenshaw/Martin Luther King Jr. Station to Exposition Boulevard

This segment is approximately 0.76 miles (4,030 feet) in length and follows the Crenshaw Boulevard right-of-way which varies in width from 100 to 200 feet in this segment. The current Base LRT Alternative alignment would transition from a below-grade to an at-grade configuration on Crenshaw Boulevard just south of Coliseum Place, and remain in an at-grade configuration to its terminus at the Metro Expo LRT line (under construction) Crenshaw/Exposition Station. The AA/DEIS/DEIR also includes evaluation of a design option to the Base LRT Alternative that provides for a below-grade configuration north to

Figure 2-1. Wilshire/La Brea Alignment Extension and Station Locations


Source: Parsons Brinckerhoff, 2008

the Metro Expo LRT Line with a below-grade station on Crenshaw Boulevard immediately south of Exposition Boulevard.

This section of the transit line assumes one possible alignment that would remain in a below-grade configuration from the planned Metro Crenshaw Line Crenshaw/Martin Luther King Jr. Station to an underground station on Crenshaw Boulevard, between Rodeo Road and Exposition Boulevard. Approximately 0.71 miles (3,749 feet) of this segment would be constructed as a bored tunnel, which would be considerably lower in cost than a cut and cover tunnel. The remaining length, approximately 270 feet, would comprise the Metro Expo LRT line (under construction) Crenshaw/Exposition Station and would be constructed using cut and cover construction methods. (As stated previously, this section is only required if the below grade LRT alignment is not included in the definition of the Locally Preferred Alternative. Otherwise, the alignment would begin north of the Crenshaw/Exposition Station).

The vertical alignment is dependent on several factors. First, at-grade and aerial LRT alignment configurations north of Exposition Boulevard may require the widening of Crenshaw Boulevard and visual impacts to the West Angeles Cathedral property. (Previous environmental reviews associated with the Exposition Line revealed concerns about visual impacts caused by aerial structures near the West Angeles Cathedral).



Second, there are impracticalities associated with transitioning up to grade and then back down to below grade in such a short segment. Approximately 1,400 feet is usually needed to make the transition from below grade to street surface. If this alternative were to follow the Base LRT Alternative alignment, it would transition to surface south of Coliseum Place and, to be in a below-grade configuration for the Metro Expo LRT line (under construction) Crenshaw/Exposition Station, would have to immediately descend back to below grade.

If the design option associated with a below grade configuration between 39th Street and Exposition Boulevard is selected, the section of the Wilshire/La Brea LRT Extension described in this section would no longer be necessary since a below grade alignment and station would already be assumed. Therefore, capital costs for this segment from the planned Metro Crenshaw Line Crenshaw/Martin Luther King Jr. Station to Exposition Boulevard vary. With selection of the design option, there would be no additional cost associated with below-grade extension and a below grade Crenshaw/Exposition Station. Without the design option, there would be an additional cost.

2.1.2 Exposition Boulevard to Adams Boulevard

In this segment of Crenshaw Boulevard, which is approximately 0.66 miles (3,465 feet) in length, the right-of-way is 100 feet wide, with businesses fronting each side of the street. Both at-grade and aerial configurations are considered to be difficult because of the extensive property takes and business displacements that would be required and the severe physical constraint of transitioning up to the street surface. For example, the distance between Exposition and Jefferson Boulevards is approximately 1,000 feet and, as noted above, approximately 1,400 feet is needed to make the transition, which would have to occur north of Jefferson Boulevard to surface at 29th Street. The remaining 1,000 feet to Adams Boulevard could be at grade, but the potential station at this location would require extensive property takes, relocations, and/or business relocations. An aerial configuration would likely have a difficult transition from a below grade configuration. It would also require a corresponding aerial station to be located north of Adams Boulevard, where the street radius is in the order of 400 feet, making it too tight to accommodate a station platform. With the exception of the optional below-grade station at Adams Boulevard, approximately 0.61 miles (3,221 feet) of this section could be constructed as a bored tunnel, which could have fewer impacts than a cut-and-cover tunnel.

2.1.3 Adams Boulevard to Pico/San Vicente Boulevards

This segment of Crenshaw Boulevard is 1.58 miles (8,350 feet) in length. The first 0.59 miles (3,100 feet) of the Crenshaw Boulevard to Washington Boulevard is in a right-of-way that is typically 100 feet wide. There are some businesses near both Adams and Washington Boulevards, but most buildings are residential units fronting both sides of the Crenshaw Boulevard. A major interchange with the Santa Monica Freeway (the I-10 Freeway) is located about 0.19 miles (1,003 feet) north of Adams Boulevard.

The alignment in this section focuses on a below grade configuration. Alignments in an at-grade or aerial configuration may require extensive property acquisitions and significant traffic impacts, particularly with turning movements at the I-10 Freeway



interchange. North of Adams Boulevard, the street grade increases to approximately 6 percent at the freeway interchange, which could significantly impact LRT operating speeds and exceeds the Metro design criteria.

North of Washington Boulevard, the alignment would follow Crenshaw Boulevard to just south of Venice Boulevard, where it would curve to the northwest on an approximate 800-foot radius curve, following Venice and San Vicente Boulevards to Pico Boulevard. For the alignment to turn from Crenshaw Boulevard to Venice Boulevard a bored tunnel is the only practical construction method and an 800 foot radius curve is the minimum radius for tunneling. The tunnel alignment would extend under several businesses and residences at the southwest corner of Crenshaw Boulevard and Venice Boulevard.

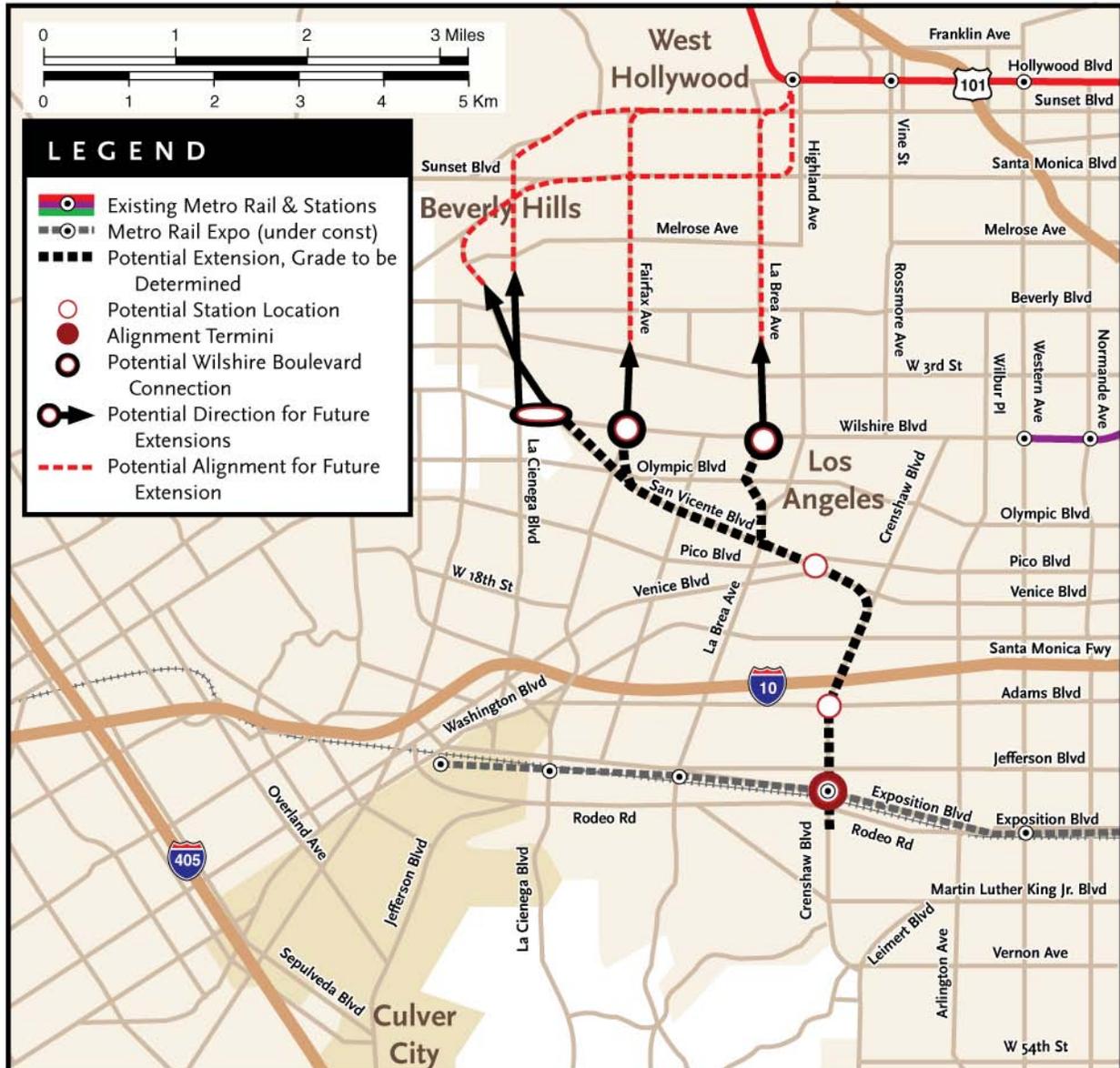
The construction of a below grade alignment is also the only practical method for this section because of the visual impacts that would be caused by an aerial structure and the extensive property acquisitions that would be required for both aerial and at-grade configurations. Additionally, the Crenshaw Boulevard right-of-way is typically only 80 feet wide and the historic West Boulevard Bridge over Venice Boulevard would likely preclude street widening, imposing severe constraints for both the aerial and at-grade configurations. With the exception of the below-grade station at Pico/San Vicente Boulevards (approximately 270 feet), all of this segment could be constructed as a bored tunnel provided that a minimum 800 foot or larger radius curve is maintained as described above. If the minimum radius cannot be maintained, cut and cover construction would be required.

2.1.4 Pico/San Vicente Boulevards to San Vicente Boulevard/La Brea Avenue

The alignment in this segment would follow San Vicente Boulevard to La Brea Avenue, a distance of 0.24 miles (1,270-feet). For the ultimate connection to Wilshire/La Brea, the alignment would likely continue below grade. While, the San Vicente Boulevard right-of-way is wide enough in this segment to accommodate an at-grade or aerial configuration, its length is inadequate to provide a transition from below grade to at grade or to an aerial configuration. For the potential alignments that lead to more westerly Wilshire Boulevard connections (Wilshire/Fairfax, Wilshire/La Cienega, or Wilshire/San Vicente), an at-grade or aerial configuration may be considered since the San Vicente Boulevard is potentially wide enough to accommodate such configurations. This section may, therefore, host a viable junction for branching service further to the west for the LRT extension.

2.1.5 San Vicente Boulevard/La Brea Avenue to Wilshire Boulevard/La Brea Avenue

From San Vicente Boulevard, the Wilshire/La Brea alignment would turn north and follow La Brea Avenue to a terminus at Wilshire Boulevard, a distance of 0.98 miles (5,165 feet). A terminal station and tail track would be located at Wilshire Boulevard. The proposed station at La Brea Avenue could serve as a transfer point for transit riders transferring to the Metro Rapid Bus service on Wilshire Boulevard or to a future extension of the Metro Purple Line on Wilshire Boulevard. (See Figure 2-2 for potential extensions on San Vicente Boulevard towards Fairfax and La Cienega, and other potential extensions to Hollywood and West Hollywood).

Figure 2-2. Potential Extensions


Source: Parsons Brinckerhoff, 2008

The right-of-way on La Brea Avenue is typically only 100 feet wide, making any aerial or at-grade alignment difficult due to visual impacts that would be caused by an aerial structure and the extensive property acquisitions that would be required by at-grade configuration. In addition, even if no right-of-way were required, the aerial and at-grade configurations could severely impact traffic by removing parking lanes (aerial configuration) or traffic lanes (at-grade configuration) in each direction. Because of the tight curvature of the street, which precludes the possibility of using bored tunneling methods, the construction of a below-grade cut and cover tunnel may be a more practical construction method for this segment. Bored tunnel construction generally requires a



minimum 800 foot or larger radius curve. It may also require securement of below-grade easements under residential areas. This assumption should be evaluated in subsequent analysis of an extension.

2.2 Stations

The Wilshire/La Brea LRT extension could include three new stations for passenger access to the system, which include the following:

- Crenshaw/Adams (optional station)
- Pico/San Vicente (site of a significant bus transit center)
- Wilshire/La Brea (connections to Metro Rapid service and connection to future Metro Purple Line extension)

Determination of station locations should be made during a future environmental review.

A new below-grade Crenshaw/Exposition Station may or may not be included in the northern extension, depending on whether the design option for a below grade alignment between 39th and Exposition is included in the definition of the LRT Alternative.

It is assumed that the proposed stations include signage, maps, fixtures, furnishings, lighting, and communication equipment that would be of a consistent design throughout the system. This assumption supports the convenience of transit passengers and minimizes capital, operations, and maintenance costs.

2.2.1 Station Platforms

LRT stations consist of center or side platforms, 270 feet long, to accommodate LRT trains with up to three cars. 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 platform to access the trains. Platforms would be approximately 18 feet wide for center platform stations and 14 feet wide for side platform stations. The platforms would be 39 inches high to allow level-boarding for full accessibility. All of the stations on the Wilshire/La Brea LRT extension are proposed as center platform stations.

All platforms would be fully accessible and comply with the Americans with Disabilities Act (ADA). They would include signage, safety, and security equipment such as closed circuit television (CCTV), public announcement (PA) system, passenger assistance telephones (PTEL), and variable message signs (VMS) that would provide real-time information. The fare collection area includes ticket vending machine (TVM), stand alone validators (SAVs), and information cases. The SAVs function as fare gates that define the limit of the “free” and “paid” area where patrons must have a ticket.



2.2.2 Station Types

All LRT station types for the Wilshire/La Brea LRT extension would be below-grade configurations and be comprised of 270 feet long platforms that accommodate LRT trains with up to three cars.

Below-grade stations have off-street entrances comprised of vertical circulation elements that generally bring patrons to a mezzanine level where the ticketing functions are located. The platforms are accessed from the mezzanine level. The platform widths, and the widths of the stairs, escalators and emergency exits, are determined by the patronage data and ADA required clearances.

2.3 Operating Plan

A conceptual operating plan has been developed for the LRT Alternative for ridership forecasting and capital and operating cost estimating purposes. The proposed LRT line 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, Green, and Gold Lines. Service would extend from approximately 4:00 a.m. to 1:00 a.m.

Weekday LRT service in 2030 as proposed would operate approximately every 5 minutes during peak periods (i.e., 6:00 to 9:00 a.m. and 3:00 to 7:00 p.m.) and every 10 minutes during the off-peak midday period (i.e., 9:00 a.m. to 3:00 p.m.). Service frequencies would be every 10 minutes during the early morning and late night periods (i.e., 4:00 to 6:00 a.m. and 7:00 p.m. to 1:00 a.m.) and on weekends and holidays.

The operating plan for the Wilshire/La Brea LRT extension provides for the operation of a single line operating from end to end and stopping at all intermediate stations. The line would begin at the proposed Wilshire/ La Brea Station and end at the Metro Green Line Redondo Beach Station. (Potential branches of service from points further west (Fairfax, La Cienega, or San Vicente) could join this branch line along San Vicente Boulevard.

The line would have a total length of approximately 15 miles and would have an end-to-end travel time of almost 30 minutes, with an average operating speed of 31 miles per hour.

The proposed operating plan with three-car trains and 5 minute frequencies would require a total of 31 vehicles, with spares.

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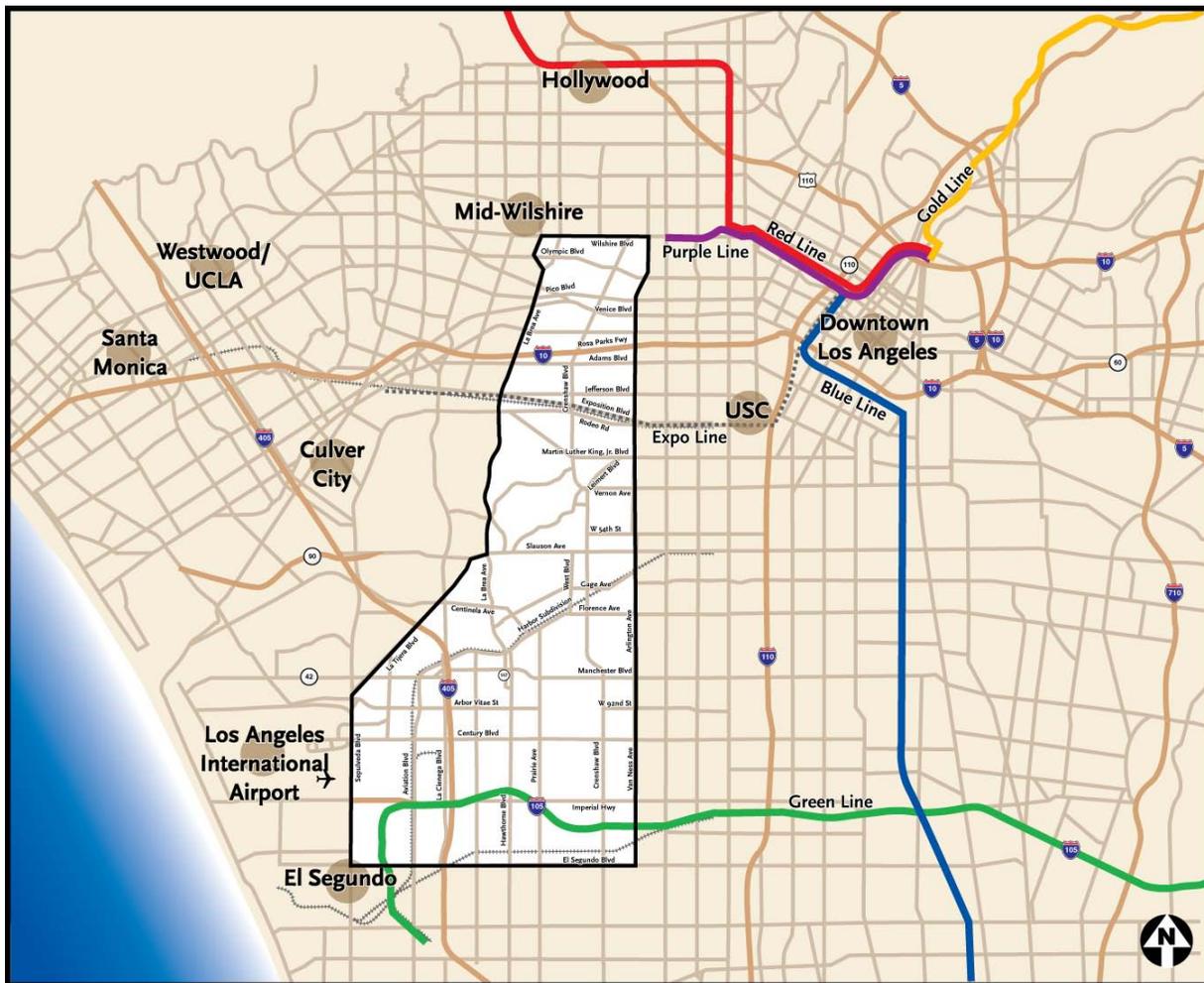
3.0 EVALUATION OF WILSHIRE/LA BREA LIGHT RAIL TRANSIT EXTENSION

This chapter presents the results of the evaluation of the Wilshire/La Brea LRT extension based on purpose and need, environmental consideration, costs, and station boardings.

3.1 Purpose and Need

The purpose of the Crenshaw Transit Corridor Project is to improve mobility in the corridor by connecting with or extending existing lines, such as the Metro Green Line, or transit lines under construction, such as the Expo LRT line. Figure 3-1 shows the location of the proposed project in relation to existing and approved transit lines.

Figure 3-1. Connections with Existing and Approved Transit Lines



Source: Parsons Brinckerhoff, 2008



The Wilshire/La Brea LRT extension would be consistent with the purpose and need for the Crenshaw Transit Corridor Project. – supporting mobility and accessibility in the corridor to major activity centers, especially for the transit-dependent; meeting growing transportation system demands; and supporting economic development and development goals, It would provide for transit trips from the Crenshaw Transit Corridor to West Los Angeles, which is a primary travel destination outside the study area. Furthermore, it establishes a potential foundation for future extensions of transit service in the direction of activity centers in Hollywood or West Hollywood.

3.2 Environmental Considerations

The Wilshire/La Brea LRT extension could potentially impact the environment and community. These impacts would need to be analyzed in full detail in a complete environmental review process at a future date. A preliminary summary of potential impacts is presented here. Table 3-1 summarizes the results from a review of environmental issues along the alignment extension. A brief discussion associated with key environmental impacts follows.

Table 3-1. Summary of Environmental Screening Results

Environmental Criteria	Potential Environmental Impacts Requiring Future Analysis
Displacements and Relocations	
▪ Residential	
– Number of Buildings	17 (requiring easement above subway)
– Number of Units	77 (requiring easement above subway)
▪ Businesses	
– Number of Buildings	19 potential buildings affected
– Number of Businesses	19 potential businesses affected
– Number of Parking Areas Affected	5
Visual	
▪ Level (minimal, moderate, high)	Minimal
▪ Landmarks of Visual Importance	0
Noise and Vibration	
▪ Number of Sensitive Receptors by Type	
– Number of Residences	500 residents requiring analysis for vibration impacts
– Number of Schools	1 school requiring analysis for vibration impacts
– Number of Other Receptors (hospitals, parks, etc)	1 church requiring analysis for vibration impacts
Cultural and Natural Resources	
▪ Number of Historic Properties	
– National Register of Historic Places	8 properties within a zone of potential impact
– California Register of Historical Resources	15 properties within a zone of potential impact
– Local Landmarks	7 landmarks within a zone of potential impact
– California Historical Landmarks, California Points of Historical Interest, etc	0



- Right-of-Way / Displacements / Relocations – The LRT extension could involve requirements for purchase of easements below certain properties. Under this scenario, the structures associated with those properties would not be displaced or removed. An easement for the below grade alignment could potentially affect 17 residential buildings containing an estimated 77 units. The northern alignment could potentially result in impacts to approximately 19 businesses, which could include the need to acquire easements, partial or full acquisitions. This would be determined at a future date.
- Noise / Vibration – The LRT extension could potentially cause vibration impacts requiring mitigations. An estimated 500 residences, a church, and a school lie within an area requiring analysis to determine impacts. Given available tunneling methods, the magnitude of impacts, if any, is not expected to be significant. Such impacts would need to be established in a future environmental study.
- Visual – Below grade alignment and stations would minimize visual impacts.
- Cultural and Natural Resources – The alignment also has the potential to affect cultural and natural resources. The number of properties on the National Register of Historic Places (NRHP) and California Register of Historic Resources were identified along the alignment, as well as local and California Historical Landmarks. Given the nature of the alignment, the impact may be minimal, if any.
- Land Use – Under existing conditions, the predominant land uses along the Wilshire/La Brea LRT extension are transit-supportive uses, including a mix of commercial and medium to high density residential. There are high population and employment densities, as well as concentrations of low-income and zero-vehicle households within 1/4 mile of the LRT alignment.
- Economic Development – The Wilshire/La Brea LRT extension is located (20 percent) within or adjacent to the Community Redevelopment Authority (CRA)/LA Mid-City Corridors Redevelopment Area. Portions of the optional LRT alignment are located within the West Adams-Baldwin Hills-Leimert Park Community Plan area, which extends as far north as the I-10 Freeway. This community plan includes transit oriented development (TOD) provisions along Crenshaw Boulevard, as does the CRA/LA concept plan.
- Community – In previous public meetings for the Crenshaw Transit Corridor Project, no major opposition was expressed towards the Wilshire/La Brea LRT extension by the general public, stakeholders, or local jurisdictions. An extension toward Wilshire/La Brea was, in fact, suggested during the scoping process by community members.

3.3 Costs

A rough order of magnitude (ROM) capital cost estimate has been prepared for the Wilshire/La Brea LRT Extension as a fully below-grade alignment extending from Exposition Boulevard to Wilshire Boulevard/La Brea Avenue following the alignment described in Section 2.1. Costs are presented in several scenarios. Scenario 1 assumes the selection of a below-grade design option LRT Alternative that provides for a below-



grade configuration north to the Expo LRT Line with a below-grade station on Crenshaw Boulevard immediately south of Exposition Boulevard. This is shown as Scenario 1.

Scenario 2 estimates the ROM capital costs for the Wilshire/La Brea LRT Extension that includes a below-grade segment from north of Martin Luther King Boulevard to Exposition Boulevard based on this segment remaining at-grade under the Base LRT Alternative.

These scenarios are re-stated below:

- Scenario 1 – Assumes initial LRT construction is below-grade between Exposition Boulevard and 39th Street. The northern extension would start from Exposition Boulevard and a below-grade station at Crenshaw/Exposition. This scenario assumes that the Wilshire/La Brea extension can begin north of the Crenshaw/Exposition Station.
- Scenario 2 – Assumes initial LRT construction is at-grade between Exposition Boulevard and 39th Street. The northern extension would start from north of Martin Luther King Boulevard to Exposition Boulevard and include a new below-grade Crenshaw/Exposition Station on the way to Wilshire/La Brea.

3.3.1 Methodology

The methodology used to generate the ROM capital cost estimate for a future extension LRT alignment has been developed in general conformance with the FTA guidelines for estimating capital costs for New Starts projects. The ROM capital cost estimates are based on the conceptual alignment and profile contained in Appendices A and B of this report and corresponding unit costs.

The unit costs used to prepare the estimates were derived from Metro’s historical data from comparable transit system applications. For items of work where historical data from Metro was not available, other sources of data, such as the latest Caltrans Cost Data, was used. Adjustments for differences between the published date of the historical cost data and the current base year of the cost estimates used an escalation factor calculated using the Construction Cost Index (CCI) value published by the *Engineering News Record* (ENR), for each of the periods in question. All unit costs include the contractor’s direct construction costs, plus all taxes, general expenses, overhead, and profit. The unit costs for items of construction do not include items such as engineering, construction management, owner’s administrative costs, and allowances for contingencies, which are added as percentage add-ons to the cost estimate.



3.3.2 Cost Estimate Results

The capital cost estimates (in constant 2008 million dollars) are presented in Table 3-2.

Table 3-2. Capital Cost Estimates

Cost Categories	Costs (\$Millions)	
	Scenario 1 Northern Segment - Below-Grade – Crenshaw /Exposition to Wilshire/La Brea	Scenario 2 Northern Segment - Below-Grade Option – Crenshaw / Martin Luther King, Jr. to Wilshire/La Brea
Guideway and Track Elements	282.4	329.2
Stations, Stops, Terminals, Intermodal	292.5	390.5
Support Facilities: Yards, Shops, Administrative Buildings	-	-
Sitework and Special Conditions	79.6	93.3
Communication Systems	24.0	24.0
Construction Subtotal	\$ 678.5	\$ 837.0
Right-of-Way, Land, Existing Improvements	21.3	15.0
Vehicles	48.3	48.3
Professional Services	223.9	276.2
Unallocated Contingency	97.2	117.6
Finance Charges	-	-
Total Cost (2008) Million Dollars	\$ 1,069.2*	\$ 1,294.1*
Total Length in Miles	3.3	4.1

* With the deletion or deferral of a below-grade station at Adams Boulevard, the estimated cost would decrease by approximately \$156 million.

3.4 Station Boardings

Forecast year 2030 station by station daily boardings were estimated for the Base LRT Alternative and the Wilshire/La Brea LRT Extension. As identified in Table 3-3, the total number of boardings based on preliminary ridership estimates as of August 2008 would increase from approximately 13,000 to over 31,000 with the extension from Metro Expo LRT line (under construction) Crenshaw/Exposition Station to Wilshire/La Brea. This represents a substantial increase in daily boardings over the Base LRT Alternative. This difference in ridership does suggest the value of such an extension for future consideration. These estimates do not yet account for additional passengers due to use of transit by airport passengers or the additional passengers due to other projects funded by Measure R (extension of Exposition Line, Phase II (Culver City to Santa Monica), Regional Connector, and Westside Extension.



Table 3-3. 2030 Comparison of Estimated Boardings* for Base LRT Alternative and Wilshire/La Brea LRT Extension

Station	Base LRT Alternative (Crenshaw/Exposition to Redondo Beach)*	Crenshaw LRT Alternative with Wilshire/La Brea Extension (Wilshire/La Brea to Redondo Beach)**
La Brea/Wilshire	N/A	10,300
Pico/San Vicente	N/A	2,200
Crenshaw/Adams	N/A	1,800
Crenshaw/Exposition	3,100	3,900
Crenshaw/Martin Luther King Jr.	1,400	1,300
Crenshaw/Slauson	1,000	1,500
Florence/West	700	1000
Florence/La Brea	1,500	2,300
Aviation/Manchester	800	1,100
Aviation/Century	1,400	1,800
Mariposa/Nash	700	1,000
El Segundo/Nash	300	400
Douglas St/Santa Fe ROW	900	1,300
Marine/Freeman/Compton	900	1,500
Total	12,700	31,400
Average Boardings per Mile	1,500	2,700

* Boardings do not include airport passengers or additional passengers due to other projects funded by Measure R.

** Boardings for Wilshire / La Brea assume interactions with a Westside Extension (Purple Line) to Westwood.



4.0 CONCLUSION

During the initial screening of the LRT corridor alternatives, the Wilshire/La Brea LRT extension was considered, but was not included as part of the a LRT Alternative for further environmental review. This decision was due to a need to more thoroughly document the feasibility and need for such an alignment. Initial ridership and cost estimates suggested that the northern extension would not be as cost effective until the Westside Extension is built. As identified in the *Alternatives Screening Report*, the alternative consisting of the LRT extension to Wilshire/La Brea had a significantly higher capital cost than the shorter alignment with a terminus at Exposition Boulevard. The cost of the extension is high due to the assumed below-grade configuration of the alignment and the potential additional stations. As previously stated, the below-grade configuration is considered to be a practical alignment configuration due to right-of-way constraints prohibiting an at-grade alignment without the substantial acquisition of properties and/or the displacement of buildings. An aerial alignment may face constraints within the existing public right-of-way without acquisitions, safety impacts to left-turn traffic at intersections, and visual impacts to adjacent properties. Any decisions related to alignment and grade would need to be established in a future environmental study.

The proposed extension could potentially improve regional connectivity by offering improved transfer connections and access to major activity centers. The existing Rapid Bus service along Wilshire Boulevard provides access to the major activity centers of West Los Angeles, Mid-Wilshire, and Central Los Angeles. Access to Central Los Angeles is also provided by the Metro Expo LRT line (under construction) and the Metro Purple Line. With the future Westside Extension (currently under environmental study), the Wilshire/La Brea LRT extension could improve access to major activity centers and travel markets, particularly access to West Los Angeles, (including the communities of Beverly Hills, Century City, and Westwood)

In the future, access to the Metro Red Line and more northern activity centers, such as Hollywood or West Hollywood, could be provided by possible extension of transit service north of Wilshire Boulevard. The Wilshire/La Brea LRT extension would provide an opportunity for a future extension further north via La Brea Avenue (or via other corridors, such as Fairfax, La Cienega, and San Vicente).

Further environmental analysis would need to be conducted to confirm costs, update ridership estimates, and identify all environmental impacts. While, the Wilshire/La Brea LRT extension could potentially involve some impacts to the environment and community, does provide environmental benefits. The LRT extension is supportive of surrounding and adjacent land uses. Implementation of this extension would provide opportunities for economic development. Furthermore, this future LRT extension offers improved transit facilities, which would benefit the large number of surrounding low-income and zero-vehicle households.

Considering all of the various analyses contained within this report, a connection between Crenshaw/Exposition toward Wilshire/La Brea or points on Wilshire Boulevard further west could provide an important addition to the future transportation network in Los Angeles County.

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