

# Crenshaw Transit Corridor Project

Draft Environmental Impact Statement/Draft Environmental Impact Report  
*Executive Summary*



Metro™



U.S. Department  
of Transportation  
Federal Transit  
Administration

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# CRENSHAW TRANSIT CORRIDOR PROJECT

## DRAFT ENVIRONMENTAL IMPACT STATEMENT/ DRAFT ENVIRONMENTAL IMPACT REPORT

### EXECUTIVE SUMMARY

State Clearinghouse No. 2007091148



**Metro**



U.S. Department of Transportation  
Federal Transit Administration



*Crenshaw Transit Corridor As Part of the Regional Transportation System.*

## ES.1 Introduction

The Crenshaw Corridor, a heavily traveled north-south oriented urban corridor in Los Angeles County, California, is being considered for transit improvements by the Los Angeles County Metropolitan Transportation Authority (Metro) in cooperation with the Federal Transit Administration (FTA). These agencies have initiated an environmental review of proposed transit improvements in the corridor as a key step in providing the Metro Board and the general public with information that will support selection of a Locally Preferred Alternative (LPA). For purposes of the environmental review, Metro is serving as Lead Agency under the provisions of the California Environmental Quality Act (CEQA) and FTA is Lead Agency as required by the National Environmental Policy Act (NEPA). The environmental review entails preparation of a Draft Environmental Impact Statement (DEIS) to satisfy Federal requirements and a Draft Environmental Impact Report (DEIR) to satisfy State requirements. Highlighted in this summary is the planning and review process to date along

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with the comparative evaluation of proposed transit improvement alternatives for the corridor that will be considered by the Metro Board.

## **ES.2 Purpose of this Environmental Document**

This document describes the existing conditions and environmental setting in the Crenshaw Corridor. The environmental review process provides the public with an opportunity to review and comment on the alternatives and the environmental analysis presented in this document. The document discusses the purpose and need for the project and identifies and evaluates proposed transit improvement alternatives. Where appropriate mitigation measures are identified to reduce potentially adverse environmental impacts that may result from the alignments or alternatives being considered.

This DEIS/DEIR does not make recommendations regarding the approval or denial of the Crenshaw Transit Project or any of the transit improvement alternatives that are being considered. This DEIS/DEIR is intended as a disclosure document, to inform public agency decision-makers and the public of the environmental effects of the transit alternatives under consideration. Metro and the FTA shall consider the information included in this DEIS/DEIR, along with other information, which may be presented to the agency, prior to the selection of a LPA and the adoption of the project. Other agencies, such as the California Department of Transportation (Caltrans), and the Cities of Los Angeles, Inglewood, Hawthorne, and El Segundo, as well as the County of Los Angeles, will also be involved in reviewing the Project. On the Federal level, agencies with potential reviewing/permitting authorities include the Advisory Council on Historic Preservation, Federal Aviation Administration, Federal Railroad Administration, the Occupational Safety and Health Administration, and the Environmental Protection Agency. The many agencies that evaluate the DEIS/DEIR will continue to be involved in the review process of the Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR).

## **ES.3 Environmental Review Process**

This DEIS/DEIR has been prepared to meet the requirements of NEPA and CEQA. As required by these laws, the environmental review process must be completed before the proposed project

can be approved. The goal of both legislative acts is to ensure that local and federal decision-makers are aware of the environmental consequences of a project before making a decision whether to proceed.



*View of the Crenshaw Corridor looking north from the Hyde Park area.*

One of the first steps in the environmental review process is to publish a Notice of Intent (NOI) to prepare an EIS in the Federal Register. This notice was published on October 2, 2007 (Vol 72, No 190) and provided a brief description of the proposed project and invited comment on issues that would be addressed in the environmental document. A Notice of Preparation (NOP) of an EIR, the CEQA equivalent of the NOI, was also prepared and circulated by the State of California on September 28, 2007. In addition to these notices, various other means were used to invite public comment on the project. Three public scoping workshops, attended by 118 persons in total, were held between October 15 and 20, 2007. Letters of invitation were mailed to a total of 99,400 addresses within a 1/4-mile of the Crenshaw Transit Corridor alternative alignments. Articles and advertisements were published in a number of local newspapers including several non-English announcements, including the Korea Daily (Korean), La Opinion (Spanish), Daily Hawthorne Press Tribune, Nor Gyank (Armenian English/French), LA Sentinel, Watts Times and Metro Daily Brief advertisements in the Peninsula newspapers. Electronic mailings (e-mail blasts) were sent to stakeholders, including elected officials, council districts, and community-

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## CRENSHAW CORRIDOR LOCATION

based organizations. Metro also distributed bus pamphlets and placed postings in community and council district newsletters. The 30-day public scoping comment period was extended until November 20, 2007, and all 365 comments that were received on the project were documented and reviewed in the preparation of this document.



*Numerous community meetings have been held as part of the Alternatives evaluation and project formulation process.*

Metro will initiate a second round of public comment with the release of this DEIS/DEIR. The public review period of the completed DEIS/DEIR will last for 45 days. During the public review period, this document will be placed in local public libraries and other repository sites. The document will be made available on the Metro website ([www.metro.net/crenshaw](http://www.metro.net/crenshaw)) and information about public hearings and other ongoing project activities is available via the project hotline at (213) 922-2736. Public hearings will be held to receive oral and written testimony on the DEIS/DEIR from the general public. Metro will provide notice of these public involvement meetings in compliance with CEQA and NEPA. For a detailed description of the environmental review process, and related public involvement opportunities, please refer to Sections 2.0 Alternatives Considered and 6.0 Community Participation of this document.

Public hearing testimony and written comments on the DEIS/DEIR will be compiled during the public review period. In Fall 2009, the Metro Board will consider public comments as

it contemplates selection of a LPA for the Crenshaw Transit Corridor. Public comments and Metro responses will be incorporated into the FEIS/FEIR. These final reports, to be prepared in 2010, will focus on the environmental review of the LPA. Metro and the FTA cannot initiate the proposed project until the Final EIS/EIR is certified with all necessary mitigation measures and an adopted Mitigation Monitoring Program. Following certification of the FEIR by the Metro Board, the FTA will consider the FEIS and issue a public Record of Decision (ROD) to complete the final step in the environmental review of the project.

### ES.4 Location of the Crenshaw Corridor

The Crenshaw Transit Corridor study area is generally a north-south corridor that extends approximately ten miles in length through much of Central Los Angeles. The study area includes approximately 33 square miles and portions of five jurisdictions: the Cities of Los Angeles, Inglewood, Hawthorne, and El Segundo, as well as portions of unincorporated Los Angeles County. The study area, as shown below, is generally defined as the area extending north to Wilshire Boulevard and the Park Mile area of Los Angeles; east to Arlington Avenue; south to El Segundo Boulevard and the downtown Hawthorne area; and west to Sepulveda Boulevard, La Tijera Boulevard, and La Brea Avenue. Three major interstate highways traverse the study area, including the Santa Monica Freeway (I-10) and Glenn Anderson Freeway (I-105), running east-west and the San Diego Freeway (I-405) which runs north-south. The Harbor Freeway (I-110) parallels the corridor, running north-south immediately to the east of the study area.

*Who is on the Metro Board? Metro is governed by a 13-member Board of Directors comprised of: five Los Angeles County Supervisors; the Mayor of Los Angeles; three Los Angeles mayor-appointed members; four city council members representing the other 87 cities in Los Angeles County; and the Governor of California appoints one non-voting member.*

PROJECT PURPOSE



The Crenshaw Corridor includes five jurisdictions and covers approximately 33 square miles.

ES.5 Previous Planning Studies

In 1967, the Crenshaw Transit Corridor was initially included in the region's first rail system plan. Over the past 40 years, Metro and its predecessor agencies - the Southern California Rapid Transit District (SCRTD) and the Los Angeles County Transportation Commission (LACTC) have undertaken numerous plans and studies that documented the lack of connectivity and mobility and the need for transportation improvements in the Crenshaw Transit Corridor. These included the Inner-City Transit Needs Assessment Study Final Report (1993) and the Community Redevelopment Agency's Crenshaw Corridor Recovery and Revitalization Environmental Impact

Report (1994). Studies concluded that transportation within and from the Crenshaw Corridor was constrained, congested, and urgently in need of system improvements.



View of the Yellow Car Line 5 that is heading south on Leimert Avenue towards Crenshaw Boulevards. The Yellow Car Line operated in the medians of Crenshaw Boulevard, Leimert Avenue and Hawthorne Boulevard until the 1950s.

Metro has completed three transportation studies of the Crenshaw Transit Corridor over the past 13 years alone. In 1994, the Crenshaw-Prairie Corridor Preliminary Planning Study clearly identified the need for high-capacity transit system improvements. These options were studied further in December 2000, with the Crenshaw-Prairie Corridor Route Refinement Study. This report identified the need for viable transportation alternatives for the Crenshaw Transit Corridor. In 2003, the Crenshaw-Prairie Corridor Major Investment Study (MIS) was completed to assist decision-makers in evaluating the most effective solution, or phasing of solutions, to the transportation challenges identified in the Crenshaw Transit Corridor while achieving local goals and objectives. The MIS provided the foundation for the inclusion of the Crenshaw Transit Corridor into the Metro Long Range Plan. A description of each of these three previous studies is presented in Section 1.0 Purpose and Need of the DEIS/DEIR.

ES.6 Purpose and Need for the Project

Travel demand forecasts prepared by the Southern California Association of Governments (SCAG) and Metro over the past decade have identified the need for transit improvements

throughout the Southern California region, particularly in Los Angeles County, to meet the mandates of the federal Clean Air Act and address the increasing mobility needs of the region.

The 2008 SCAG Regional Transportation Plan (RTP) determined travel conditions in the Crenshaw Transit Corridor will worsen by 2035 and the area will not meet regional objectives for transportation mobility, accessibility, reliability, or safety without additional transportation improvements. Subsequent travel demand forecasting conducted for the current update of the Metro Long Range Plan has confirmed the continuing need for mobility improvements in the corridor.

Existing transportation facilities and services within the Crenshaw Corridor include arterial streets, freeways, bus routes, and rail lines. The topography and street grid of the corridor present unique challenges to existing transportation facilities and services. There are few north-south arterials in the corridor that cross the western portion of the Crenshaw Transit Corridor. As a result of this constrained network, pressure is placed on nearby north-south arterials such as La Cienega Boulevard and La Brea Avenue.

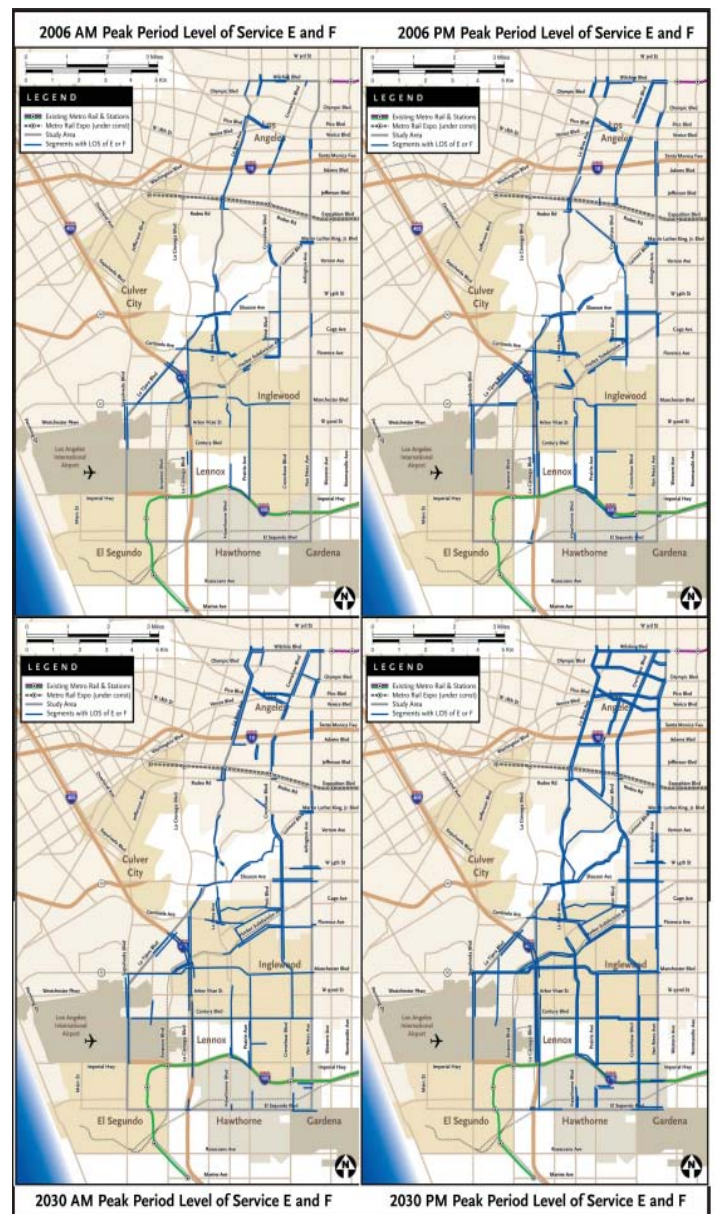
**ES.7 Major Themes**

This section describes the need for the Crenshaw Transit Corridor. The following factors highlight the need for transit improvements such as the proposed project. Each of these factors is briefly explained and described below.

- Peak Period Congestion
- Limited Transportation Accessibility
- Poor Connections with Regional Transportation
- Limited Access to Services Outside of the Corridor
- The Corridor’s Economic Future Is Dependent on Improved Accessibility
- High Transit Demand, Transit Dependency, and Transit Operation Challenges
- Benefit to the Environment and Improved Sustainability for Corridor Communities

**Peak Period Congestion**

Los Angeles has the distinction of being the most congested urban area in the country, according to the most recent annual survey of traffic congestion levels conducted by the Texas Transportation Institute. Current freeway and surface arterial facilities cannot be sufficiently expanded to handle the forecasted travel demand. The number of roadway segments within the Crenshaw Transit Corridor that are congested, that is locations



*The number of street segments in the corridor that will be overloaded and congested will double between today and the year 2030.*

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### PROJECT PURPOSE - CONGESTION

where traffic volumes consume more than 90 percent of the street capacity, is expected to more than double between 2006 and 2030 in both the AM peak travel period, 7:00 a.m. to 9:00 a.m. and the PM peak travel period, 3:00 p.m. to 7:00 p.m.

**Local Roadways.** By 2030, congestion is expected for Crenshaw Boulevard north of Manchester Boulevard to Wilshire Boulevard, the northern terminus of the study area. In addition, La Brea Avenue/Hawthorne Boulevard and Prairie Avenue, between Manchester Boulevard and the I-105 would continue to experience heavy traffic conditions and congestion during the morning peak period. The increased traffic congestion would result in lower peak period travel speeds along these corridors, generally below 30 miles-per-hour with speeds below 20 miles per hour along some sections of Crenshaw Boulevard.



*The Crenshaw Corridor is largely a residential community. Access to regional transportation linking to jobs, services and education is key. Pictured here is a morning rush hour view of Crenshaw Boulevard near the entrance to the I-10 which connects the corridor to Downtown and West Los Angeles.*

**Freeways.** The I-10, I-105 and I-405, similar to many freeways in Southern California, experience high levels of congestion, particularly during peak commute periods. The I-105, located near the southern edge of the study area, and I-405, located in the southwest portion of the study area, also experience heavy traffic throughout the day as they provide regional access to West Los Angeles and Los Angeles International Airport (LAX).

Based on the 2006 Caltrans traffic counts, the I-105 and I-405 carry an annual average daily traffic (AADT) volume of approximately 247,000 and 305,000 vehicles per day near LAX,

respectively. The AADT for the I-10 within the study area is also high, at approximately 301,000 vehicles per day. The I-10 has peak period congestion levels rated at F3, meaning that the freeway operates at Level of Service (LOS) “F” conditions for more than three hours (for each peak period direction of travel) in each peak travel period (Caltrans, 1998). The AADT for these three freeways are among the highest in the nation.



*View of Interstate 405 near Hughes Parkway. I-405 is the only north-south high capacity transportation facility within the corridor and it is congested for many hours of the day.*

Between 2006 and 2030, peak period traffic volumes on the freeway segments within the Corridor are expected to increase by 20 to 90 percent. Based on traffic forecasts for the AM peak period, traffic volumes on the I-10 near Crenshaw Boulevard are anticipated to increase by more than 50 percent, from approximately 31,000 vehicles to 48,000 vehicles. During the same peak period, traffic volumes on the I-405 are forecasted to grow 40 to 50 percent, from approximately 30,000 vehicles to 43,000 vehicles. On the I-105, AM peak period traffic volumes are expected to increase by approximately 20 percent or more, with up to 90 percent increases in the westbound direction near LAX. This would result in AM peak period traffic volumes increasing from approximately 23,000 vehicles in 2006 to 30,000 vehicles in 2030.



#### Limited Accessibility

While the Crenshaw Transit Corridor is served by two east-west running interstates, the I-10 and I-105, the corridor is constrained by the lack of north-south mobility. Major sections of the arterial network in the corridor are at or near capacity, resulting in severe congestion and a bottlenecked corridor. The terrain of the corridor, generally characterized by a series of small hills, also precludes the provision of major east-west streets in the study area from Exposition Boulevard south to Manchester Boulevard, adding further limitations to north-south traffic flow. Implementation of an effective north-south transportation network within the Crenshaw Transit Corridor is vital to alleviate current and projected connectivity and mobility problems. Improving transportation in this corridor would affect corridor residents and businesses by providing essential linkages from residential areas to commercial, activity, employment, and institutional centers within and adjacent to the corridor.



*The Baldwin Hills are a significant topographic constraint in the Crenshaw Corridor. The feature limits the continuity of the transportation network in both north-south and east-west directions increasing the importance of efficient traffic flow along Crenshaw Boulevard.*

#### Poor Connections to Regional Transportation

The corridor currently has poor connections to the regional transportation system, as there are no north-south high capacity transportation connections within the corridor. The lack of transportation and transit connections limits mobility and transportation choices. Typically, the Crenshaw Transit Corridor

residents must make several local bus and/or “Rapid Bus” transfers in order to access the existing regional transit system. Average travel times for residents within the corridor range from 32 to 42 minutes. The corridor’s primary transit service, bus transit, is constrained by vehicular congestion and increased demand for service, resulting in a lack of effectiveness and passenger convenience.

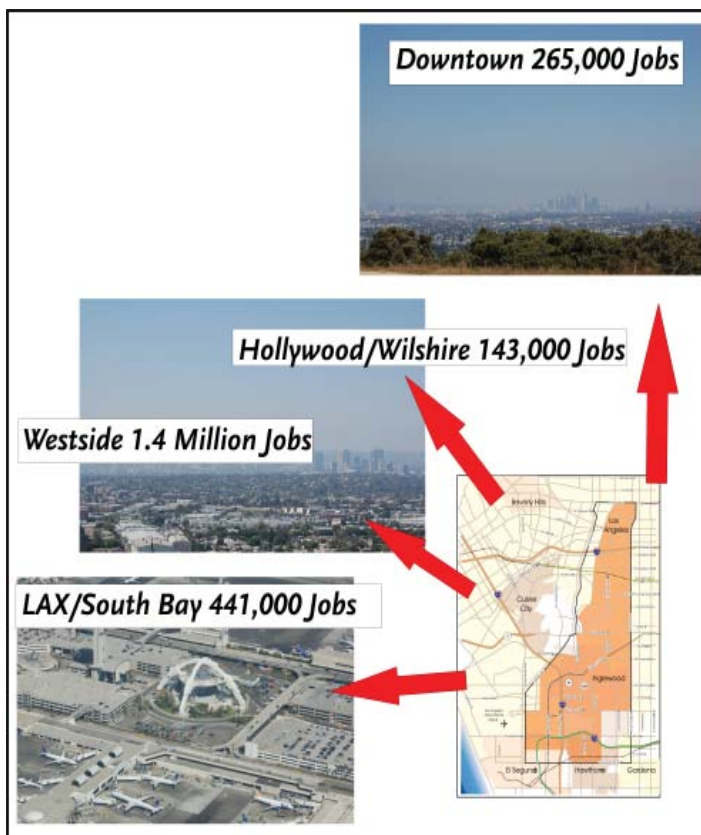
By 2030, the Crenshaw Corridor transit demand is projected to increase by approximately 55 percent. Without significant improvements and capacity enhancement, the Corridor’s transit system will be substantially overburdened, and mobility to and from the corridor will be significantly constrained. There is an urgent need to improve transportation mobility and reliability in the corridor by improving both the level and quality of transit service. As population and employment continue to grow, the lack of regional transportation system connections will become more detrimental to future corridor travel and economic development.

#### Limited Access to Services Outside of the Corridor

One of the key components to socioeconomic mobility is access to jobs, services and education. The Crenshaw Transit Corridor is predominantly residential in character. While the Corridor contains important regional destinations such as LAX, the Forum, and Hollywood Park as well as local destinations including the Baldwin Hills-Crenshaw Plaza, the AMC Magic Johnson 15 movie theatre complex, the Nate Holden Performing Arts Center, the West Angeles Church of God in Christ, and other religious institutions, jobs, retail services and colleges are located outside of the corridor. With the implementation of transit improvements in the Crenshaw Transit Corridor, many of the transit-dependent residents residing in the study area would be able to easily access important destinations outside of the corridor, as well as take advantage of community civic centers located in the cities of Inglewood and Hawthorne, and a large number of shopping districts and centers located in Koreatown, the Crenshaw District, and downtown Inglewood.

Although the Crenshaw Transit Corridor contains several employment destinations, active retail centers, and stable

residential neighborhoods, there are many more activity and employment centers located outside of the corridor such as toward downtown Los Angeles, the Westside and South Bay. Corridor travelers have limited options and accessibility to existing transit because of continuing freeway and street system congestion, slowing and overburdened bus operations, and the lack of direct connections to the regional rail system. Future transportation improvements within the corridor will need to reflect a multi-modal strategy providing travelers with a more complete set of transportation alternatives.



*The vast majority of jobs are found outside of the Crenshaw Corridor. Transit access to Downtown LA, Hollywood, Wilshire Corridor, Century City, South Bay and West Los Angeles is a critical element to the sustainability of Crenshaw Corridor communities.*

Needless to say, the corridor will continue to export person trips to outside districts at a high rate from 2006 to 2030, particularly the Westside of Los Angeles. This would be the result of growing employment opportunities located in the Westside in conjunction with the fact that the study area is primarily residential, thus residents generally work outside the study area.

### The Corridor's Economic Future Is Dependent on Improved Accessibility

A majority of the Crenshaw Transit Corridor is encompassed by redevelopment areas within the Cities of Los Angeles, Inglewood, and Hawthorne. City redevelopment agencies function in attracting private investment into economically depressed communities, eliminating blight and abandoned or unsafe properties. There is a strong connection between redevelopment and revitalization of these areas and transportation system improvements. Increased accessibility, mobility, and links to transit provide opportunity for increased development densities. All or portions of 11 redevelopment plan areas are located within the Corridor. A majority of the corridor's key activity and employment destinations are currently preparing expansion (e.g. Baldwin Hills/Crenshaw Plaza), revitalization (e.g. , downtown Inglewood), or redevelopment plans (e.g., Hollywood Park). The success of these projects and the corridor's economic future are strongly dependent on improved local and regional accessibility.

### High Transit Demand, Transit Dependency, and Transit Operation Challenges

The existing population and employment density in the Crenshaw Corridor is extremely high and very transit supportive. The Corridor population and employment densities are four times higher than Los Angeles County as a whole. The Corridor has a high concentration of low-income, minority, transit-dependent residents. More than 49 percent of all corridor households are designated as low income. In addition, 16 percent of all households in the corridor do not have access to an automobile, compared to 8 percent in the County's urbanized area. Forecasts show a growing transit-dependent population, with a projected 55 percent increase in corridor residents that rely on, or will rely on the area's transit system.

As a result of the higher than average transit ridership in the corridor, many of the buses serving the corridor are at or over capacity, resulting in overcrowding, rider pass-bys and loading delays. These issues then contribute to uneven headways and related schedule problems. Overcrowding also reduces the life of

buses and contributes to higher maintenance costs. Bus operating conditions are affected by traffic conditions under which the service operates, passenger loading time, and bus-stop spacing.

The corridor has substantial traffic congestion, high bus ridership and load factors, and closely spaced bus stops. Combined, these factors result in declining bus operating speeds, reducing competition with the private automobile. Local bus service in the Crenshaw Transit Corridor currently operates at 10 to 13 miles-per-hour and the Metro Rapid buses operate at 13 to 15 miles-per-hour during AM and PM peak periods. Operating speeds are expected to decline further in the future as congestion increases.



*Existing Rapid Bus service along Crenshaw Boulevard (lines 710 and 740) has been well received.*

### Benefit to the Environment and Improved Sustainability for Corridor Communities

The corridor is contained within the South Coast Air Basin, which has the worst air quality in the nation. Mobile source emissions from vehicles are the single largest contributor to air quality problems in the basin. The Crenshaw Transit Corridor Project would provide transportation and transit improvements that would provide the area with an energy-efficient way of reducing the number of vehicles on roadways and freeways. This would contribute to the improvement of Southern California's regional and local air quality, and a reduction in greenhouse gas emissions. Moreover, both Federal and State government are placing increased emphasis on improving the sustainability of

neighborhoods and communities. Improved accessibility utilizing transit improvements will greatly aid in achieving sustainability for neighborhoods and communities within the corridor that are highly dependent on access to employment, services and education resources outside of the boundaries of the corridor.

### ES.8 Consideration of Alternatives

As part of the environmental review process, Metro follows an established protocol to identify the transit alternatives and issues to be analyzed, including seeking input from the public, corridor stakeholders, and other affected parties. The alternatives described below provide a reasonable range of possible alternatives, which meet the project goals and objectives. As part of this process, Metro will consider all reasonable alternatives before selecting the preferred alternative that provides improved public transportation services in the Crenshaw Transit Corridor.

The process typically results in the narrowing down of options and alternatives are eliminated based on their effectiveness, environmental impacts, efficiency, financial feasibility, and equity. The end result of the process is the selection of a locally preferred alternative, or LPA, by the Metro Board. The data collection, analyses, and results of the alternatives analysis (AA) process are summarized in Section 2.0 Alternatives Considered of this DEIS/DEIR.

*What is an LPA? The DEIS/DEIR process culminates in the Metro Board of Directors making a recommendation for the Locally Preferred Alternative (LPA). A LPA is the project alternative that the Lead Agency feels will best balance the needs of the population for which the project serves. This recommendation is based on the results of the environmental evaluation as well as public opinion conveyed throughout the public participation process. The selection of an LPA allows the project to move forward into more advanced design and engineering and more detailed environmental analysis.*

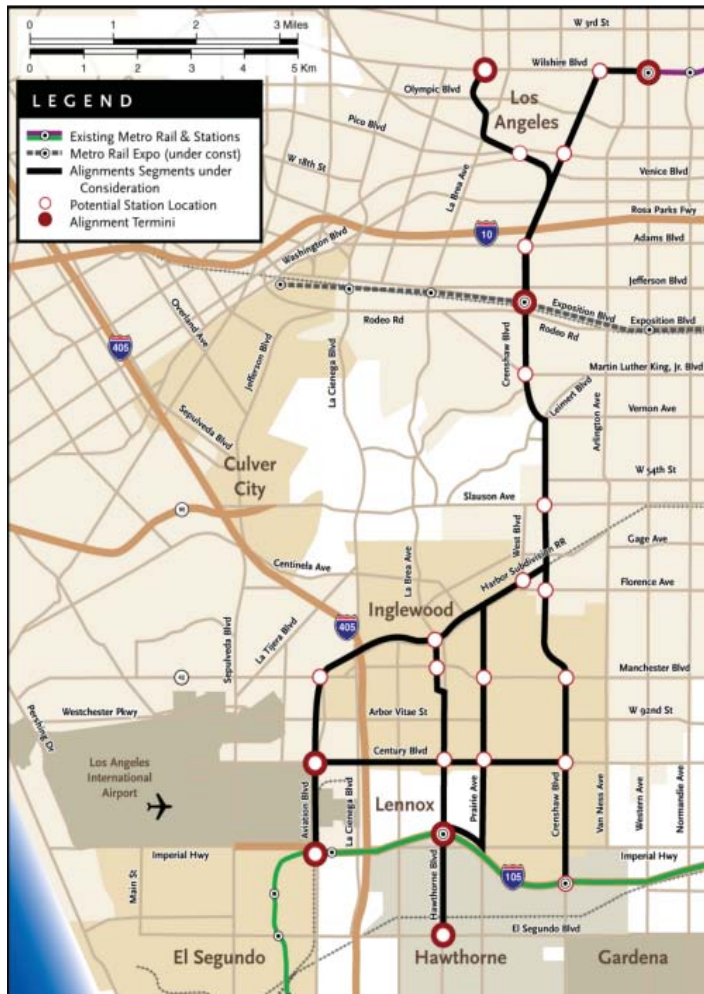
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# INITIAL ALTERNATIVES CONSIDERED

### Identification of Alternatives

The identification of alternatives for the Crenshaw Transit Corridor began with “project scoping.” The project scoping exercise defined a series of initial improvement options that were conceptual in nature. Following scoping, the planning process involved analyzing the alternatives, to determine which alternatives would be studied in detail and carried forward into the DEIS/DEIR.



Initial Alignment Alternatives.

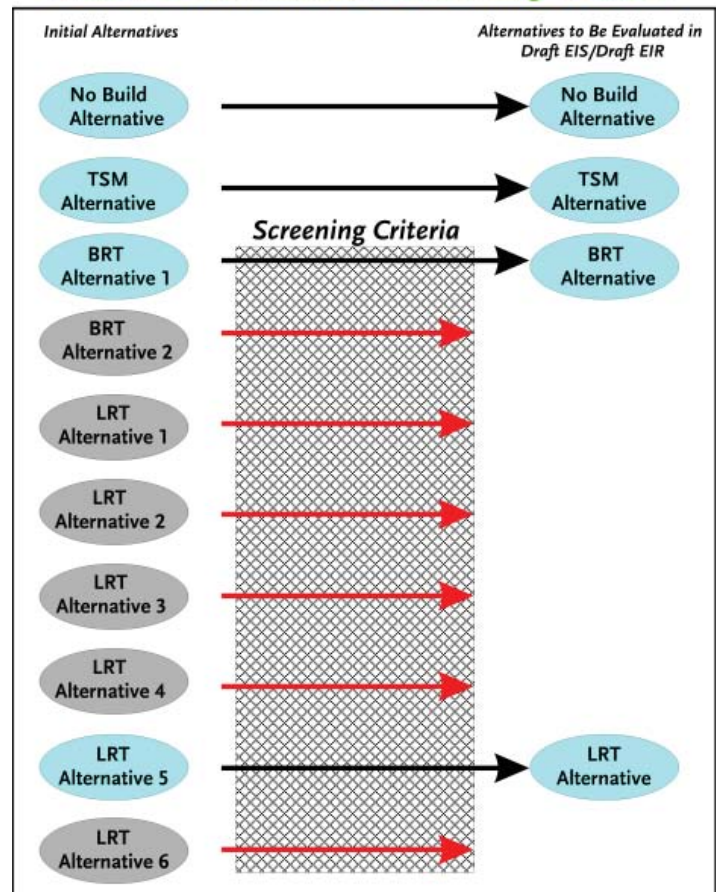
### Initial Alternatives Screening

The alternatives development and evaluation process began with identifying the initial alternatives. The initial alternatives were presented at the scoping meetings and reviewed with the public and various agencies. In addition to a No-Build Alternative and a

low cost transportation systems management (TSM) Alternative, which are required to be addressed by FTA, the initial alternatives included Bus Rapid Transit (BRT) and Light Rail Transit (LRT) operating along different alignments/routes. The initial alternatives were screened using engineering and environmental constraints, for example, comparing typical transit design configurations and alignments to existing right-of-way widths and then to the surrounding community and environment.

As a result of the initial alternatives screening, the following alignments and configurations were eliminated from further consideration.

### Crenshaw Alternatives Screening Process



- **Prairie Avenue between the Harbor Subdivision and the Metro Green Line** was eliminated because there is inadequate right-of-way between Florence Avenue and Manchester Boulevard for an at-grade or aerial (elevated)

INITIAL ALTERNATIVES  
CONSIDERED

LRT alignment or a dedicated BRT lane. In addition, there were potential engineering problems connecting to the Metro Green Line Hawthorne Station over the I-105 and the alignment had potential visual, noise, and land use impacts.

- **Crenshaw Boulevard between the Harbor Subdivision and the Metro Green Line** was eliminated due to inadequate right-of-way and the engineering problems associated with the curves between Crenshaw Drive and Manchester Boulevard. In addition, there are significant roadway elevation changes on Crenshaw Boulevard between Florence Avenue and 80<sup>th</sup> Street. Further, the landscaped median

along that section of Crenshaw Boulevard would have to be removed. In addition, there are no activity or employment centers between the Harbor Subdivision railroad and Manchester Boulevard making the project less effective. Public support was also lacking for this Alternative.

- **Century Boulevard between Crenshaw Boulevard and Aviation Boulevard** was eliminated because the width of Century Boulevard is not wide enough to accommodate an at-grade alignment and acquiring the necessary right-of-way would adversely affect existing businesses. Due to the limited street width, an elevated alignment would be an option, however, the I-405 crosses above Century Boulevard, as a result, a transit alignment would have to pass under the freeway. Near this point there is inadequate distance to transition from an elevated alignment to a below-grade alignment east of the I-405. In addition, there are limited station location options.
- **Hawthorne Boulevard between the Metro Green Line and El Segundo Boulevard** was eliminated because there is not a viable station terminus at Hawthorne/El Segundo Boulevards. As with other potential alignments, there are no activity or employment centers in the vicinity which would reduce the effectiveness of the project. This area is also characterized by low-density residential developments that would not be transit supportive.



*Alignments Eliminated in Initial Study Screening. The dotted lines indicate the alignments eliminated from further study. Options were eliminated due to physical and engineering constraints, lack of community acceptance, and potential adverse environmental effects.*

Conceptual LRT and BRT Alternatives Considered

The initial alternatives screening resulted in conceptual LRT and BRT alternatives that were analyzed in more detail. The Crenshaw Transit Corridor was divided into three sections to facilitate screening: Section A: Wilshire Boulevard to Exposition Boulevard; Section B: Exposition Boulevard to Harbor Subdivision/Florence Avenue; and Section C: Harbor Subdivision/Florence Avenue to the Metro Green Line. The detailed screening of conceptual alternatives focused on alignment alternatives that would apply to both the LRT and BRT modes. The screening was conducted sequentially, first analyzing alignments within the northern (Section A) and southern

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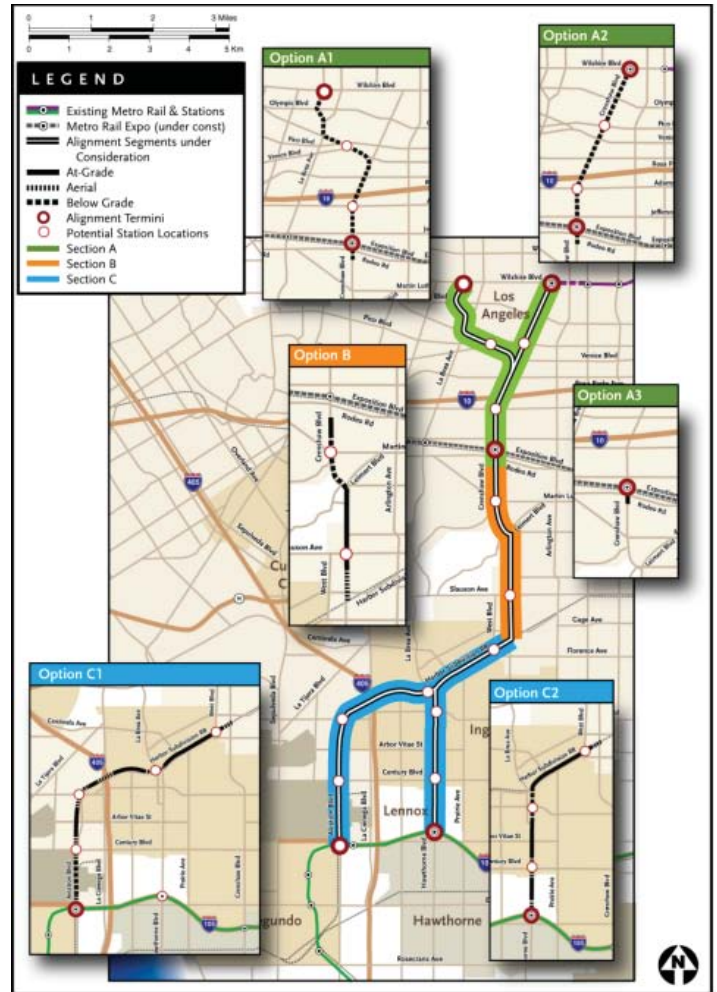
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# INITIAL ALTERNATIVES CONSIDERED

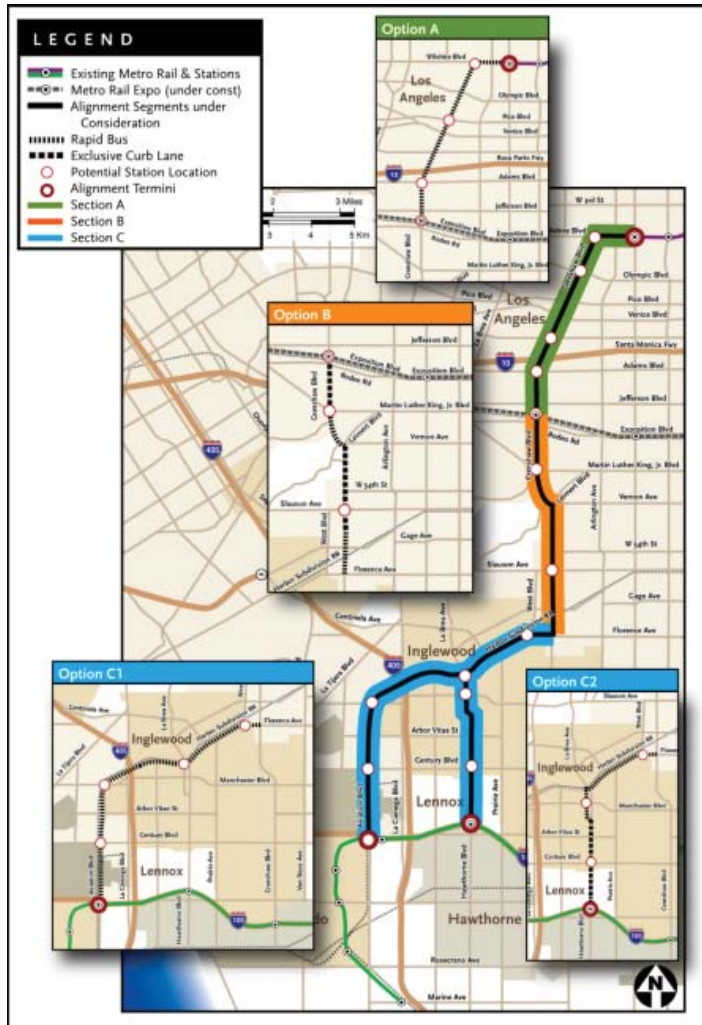
(Section C) corridor sections and then analyzing the six possible combinations of the Section A, B, and C alignments, at a corridor level.

### Six Initial Corridor Alternatives Were Evaluated

Section A, B, and C alignment options were combined into full corridor alternatives extending from the northern termini, at Wilshire Boulevard/La Brea Avenue, Wilshire/Crenshaw Boulevards, or Exposition/Crenshaw Boulevards, to Aviation Boulevard/Imperial Highway or Hawthorne Boulevard/the I-105. As shown, six full corridor alternatives were identified for screening:



Initial alignment alternatives were built up from options in three sections of the corridor.



Initial BRT corridor alternatives extended from the Purple Line, Wilshire/Western station to stations along the Green Line near I-105.

**Alignment Alternative 1** – Starts at Wilshire Boulevard, runs south on La Brea Avenue, east on San Vicente and Venice Boulevards, south on Crenshaw Boulevard, and along the Harbor Subdivision to the Metro Green Line Aviation/LAX Station at Aviation Boulevard/Imperial Highway (Options A1, B, and C1). (11.9 miles)

**Alignment Alternative 2** – Starts at Wilshire Boulevard, runs south on Crenshaw Boulevard, and along the Harbor Subdivision to the Metro Green Line Aviation/LAX Station at Aviation Boulevard/Imperial Highway (Options A2, B, and C1). (10.6 miles)

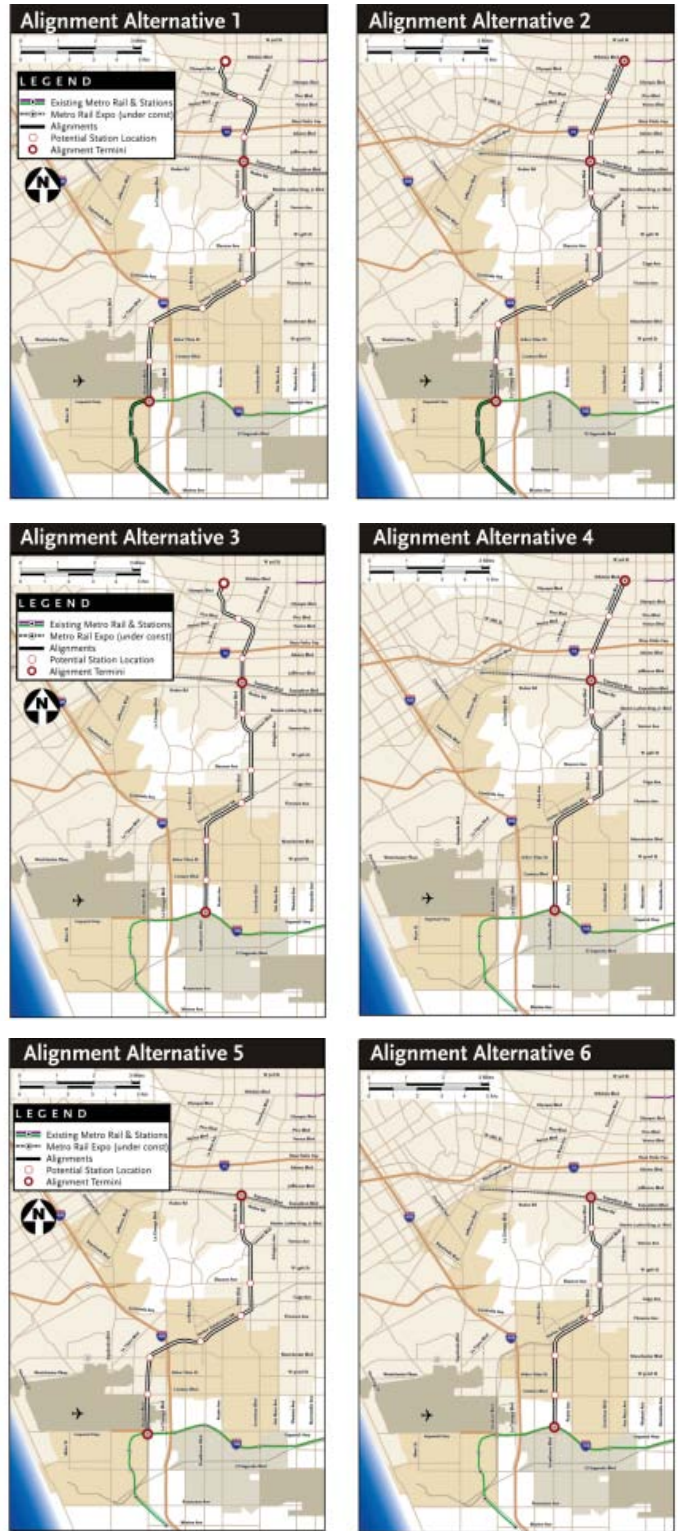
**Alignment Alternative 3** – Starts at Wilshire Boulevard, runs south on La Brea Avenue, east on San Vicente and Venice Boulevards, south on Crenshaw Boulevard, and along Market Street/La Brea Avenue/Hawthorne Boulevard to the Metro Green Line Hawthorne Station at Hawthorne Boulevard/the I-105 Freeway (Options A1, B, and C2). (10.1 miles)

**Alignment Alternative 4** – Starts at Wilshire Boulevard, runs south on Crenshaw Boulevard, and along Market Street/La Brea Avenue/Hawthorne Boulevard to the Metro Green Line Hawthorne Station at Hawthorne Boulevard/the I-105 Freeway (Options A2, B, and C2). (9.8 miles)

**Alignment Alternative 5** – Starts at Exposition Boulevard, runs south on Crenshaw Boulevard, and along the Harbor Subdivision to the Metro Green Line Aviation/LAX Station at Aviation Boulevard/Imperial Highway (Options A3, B, and C1). (8.5 miles)

**Alignment Alternative 6** – Starts at Exposition Boulevard, runs south on Crenshaw Boulevard, and along Market Street/La Brea Avenue/Hawthorne Boulevard to the Metro Green Line Hawthorne Station at Hawthorne Boulevard/the I-105 Freeway (Options A3, B, and C2). (7.0 miles)

The screening of alignment alternatives used evaluation criteria with an assumption of LRT operating characteristics including travel time savings, ridership, costs, and cost-effectiveness. Table ES-1 summarizes the LRT corridor alternatives characteristics and screening results.



Six Full Corridor Alignment Alternatives were initially studied.

*What is an Alternatives Analysis? Transit project proposals seeking to qualify for federal funding typically proceed through the FTA's process, consisting of five formal steps: Alternatives Analysis Study, Environmental Impact Statement, Preliminary Engineering, Final Design, and Construction. The Alternatives Analysis Study is designed to examine all the potential transit options available and determine a locally preferred alternative.*

Conceptual Station Locations Considered

Stations are a key component of the transit alternatives under consideration. Their location and design must balance transportation, urban design, architectural, and engineering factors. The conceptual alternatives refinement process included analyzing proposed station locations using pedestrian, automobile, and transit access; proximity to major cross streets, bus stops, Metro Rail stations, and other transit services; and, area

development projects and plans (existing, planned, and potential). Proposed station location constraints were also evaluated, including: unfavorable existing land uses; environmental impacts; potential conflicts between pedestrian, automobile, and train traffic; right-of-way impacts, including surrounding businesses and/or properties and transportation system design issues; and, standards to be maintained. To facilitate the process, these issues were divided into the following four categories: pedestrian access, neighborhood character, linkages/development, and other issues.

Table S-1. Alignment Alternatives Characteristics and Screening Results Summary

Criteria	Environmental Effects	Economic Development and Land Use	Capital and Operating Costs, Cost-Effectiveness, Financial Capability, and Federal New Starts Funding Criteria	Ridership/User Benefits	Travel Time Settings
Alignment Alt 1 (A1, B, C1)	Good	Lower population density; higher population without household vehicle; higher employment density	Highest capital cost; best cost-effective value	Highest daily boardings, high user benefits per passenger mile	Best within study area, to Westside District, and Redondo District
Alignment Alt 2 (A1, B, C2)	Good	Lower population density; higher population without household vehicle; highest employment density	Moderately high capital cost	Moderate user benefits per passenger mile	Best to Redondo District
Alignment Alt 3 (A1, B, C2)	Fair	Higher population density; higher low income population; lower employment density	Moderately high capital cost	Highest user benefits per passenger mile	Best within study area and to Westside District
Alignment Alt 4 (A2, B, C2)	Fair	Highest population density; highest low income population; lower employment density	Moderately high capital cost; low cost-effectiveness value	Moderate user benefits per passenger mile	Moderate; high within study area and to Westside District
Alignment Alt 5 (A3, B, C1)	Best	Lowest population density; higher employment density	Lower capital cost; consistent with Metro's 2001 Long Range Transportation Plan	Lowest user benefits per passenger mile	Moderate; high to Redondo District
Alignment Alt 6 (A3, B, C2)	Better	Higher population density; higher low income population; lowest employment density	Lowest capital cost; lowest cost-effectiveness value; consistent with Metro's 2001 Long Range Transportation Plan	Lowest daily boardings, low user benefits per passenger mile	Moderate



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## OTHER ALTERNATIVES CONSIDERED

### Additional Alignment Alternative Options Considered and Eliminated

**Prairie Avenue and Crenshaw Boulevard Alternatives** Through coordination with the City of Inglewood, it was suggested that two new alternatives be studied that would serve the proposed redevelopment of Hollywood Park on the site north of Century Boulevard between Prairie Avenue and Crenshaw Boulevard. They were suggested as alternatives to the proposed alignment along the Harbor Subdivision with service to downtown Inglewood. The alternatives would follow an alignment on either Prairie Avenue or Crenshaw Boulevard to serve a proposed station at Hollywood Park and Century Boulevard.

While the Prairie Avenue and Crenshaw Boulevard alternatives were previously evaluated in the initial screening process, the proposed redevelopment of Hollywood Park was not an approved element of the City of Inglewood's land use plan and could not yet be included in estimates of ridership according to FTA guidelines. At Century Boulevard, both alternatives would then continue west along Century Boulevard to serve LAX and connect with the existing Metro Green Line at Aviation Boulevard. These options were compared to each other as well as to the Harbor Subdivision alignment. Ridership potential, travel time, connections to other transportation facilities and services, physical constraints, capital costs, and environmental impacts were all considered. This supplemental analysis included land use data from major development projects yet to be approved.



A Crenshaw/Century Boulevard alignment was eliminated since it would require tunneling under residences, abandoned oil wells and across earthquake faults, raising the cost significantly.



The Prairie Avenue/Century Boulevard alignment did not compare favorably to the Harbor Subdivision alignment.

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## INITIAL MAINTENANCE FACILITY SITES CONSIDERED

A comparison of the two Inglewood alignment alternatives determined that the Prairie Avenue/Century Boulevard alignment would be shorter in length and have fewer physical constraints than the Crenshaw Boulevard/Century Boulevard alignment. The Crenshaw Boulevard/Century Boulevard alignment would require tunneling under residences, abandoned oil wells, and across earthquake faults. It was also estimated to be at least \$200 million greater in capital costs than the Prairie Avenue /Century Boulevard alignment and close to \$1 billion more than the Harbor Subdivision alignment. For these reasons, the Crenshaw Boulevard/Century Boulevard alignment was eliminated and the Prairie Avenue/Century Boulevard alignment was selected for comparison with the Harbor Subdivision alignment.

The comparison of the Prairie Avenue/Century Boulevard alignment to the Harbor Subdivision alignment found that the Prairie Avenue/Century Boulevard alignment would result in slightly lower ridership (even accounting for proposed developments) and would have a capital cost of approximately \$500 to \$700 million, or 40 percent more than the Harbor Subdivision alignment. Although more population would be served by the Prairie Avenue/Century Boulevard alignment, the number of employees served would be significantly fewer than the Harbor Subdivision alignment with service to downtown Inglewood. The proposed station in downtown Inglewood on the Harbor Subdivision alignment would also have a greater number

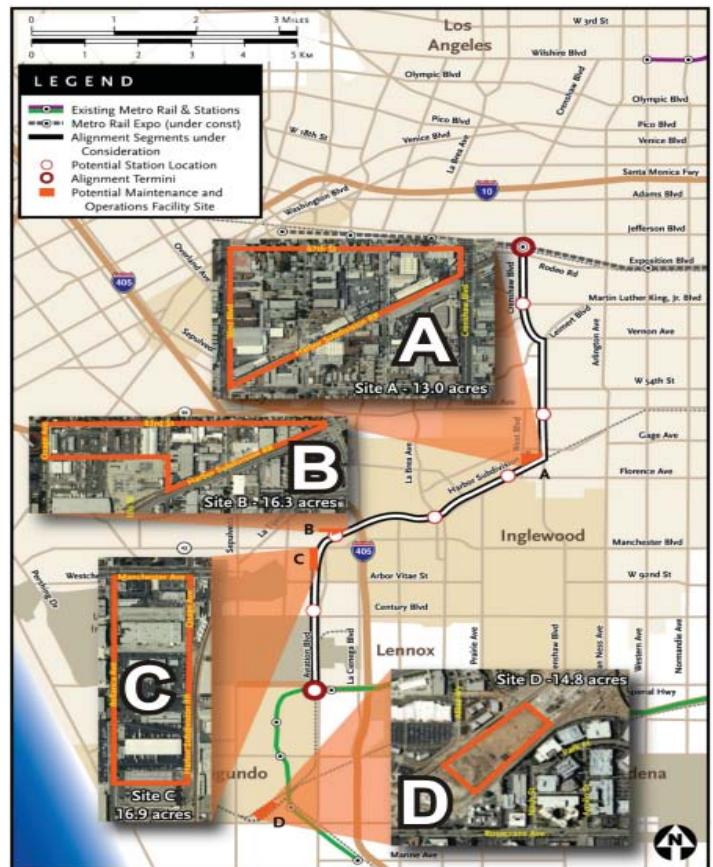
of transit connections than the proposed station at Hollywood Park on the Prairie Avenue/Century Boulevard alignment. In addition, there would also be significant and unavoidable parkland and cemetery impacts with the Prairie Avenue/Century Boulevard alignment. The Harbor Subdivision alignment is generally within an existing railroad corridor and would have fewer environmental impacts. For these reasons, the Prairie Avenue/Century Boulevard alignment was eliminated from further consideration.

### ES.9 Maintenance and Operations Facilities Site Evaluation

The operation of additional transit services along the Crenshaw Transit Corridor requires facilities where transit vehicles can be serviced and maintained on both an overnight and long-term basis. While the maintenance and storage of additional buses needed for the No-Build and TSM Alternatives could be



The view of the Harbor Subdivision at Centinela Avenue in Inglewood. The Harbor Subdivision is a portion of railroad right-of-way owned by Metro that runs east-west and north-south through the southern portion of the corridor. There are 19 at-grade surface street crossings of the railroad in the corridor.



Sites of approximately 15 acres or more are desirable. A variety of sites adjacent to corridor routes were reviewed. Four sites were initially considered for evaluation.

accommodated within existing Metro facilities, the BRT and LRT Alternatives would require additional maintenance and storage capacity. The size, location, construction, and operations of the required bus and light rail vehicle maintenance and operations facilities must be considered as part of the BRT and LRT Alternatives evaluation.

BRT maintenance and operations facilities would be capable of performing all levels of standard and articulated bus vehicle service and maintenance and would also serve as a storage area for vehicles that are not in service. LRT maintenance and operations facilities generally include vehicle storage and repair, administrative and functional uses such as offices, materials, tools, parts storage, and communications equipment rooms. The following figure illustrates four potential maintenance and operations facility sites for the Crenshaw Transit Corridor Project. Site A is approximately 13 acres and bound by 67<sup>th</sup> Street,

Crenshaw Boulevard, the Harbor Subdivision right-of-way, and West Boulevard. Site B is approximately 16.3 acres and bound by 83<sup>rd</sup> Street, the Harbor Subdivision right-of-way, and Isis Avenue. Site C is approximately 16.9 acres and is bound by Manchester Avenue, Osage Avenue/ the Harbor Subdivision right-of-way, and Bellanca Avenue. Site D is approximately 14.8 acres and in close proximity to the Metro Green Line and is bound by the Harbor Subdivision and a BNSF Branch Line, a Union Pacific Branch Line and Rosecrans Avenue. These sites were compared using several factors including, size and proximity; land use and zoning; land ownership; buffers; potential expansion; community disruption; and most valuable and best use. A comparison of the sites is shown in Table ES-2. Based on the analysis, the four potential maintenance yard sites were ranked as follows: 1) Site D, 2) Site B, 3) Site C, and 4) Site A.

**Table ES-2. Maintenance and Operations Facility Screening Summary**

Criteria	Site A	Site B	Site C	Site D
Size and Proximity	13 acres; directly adjacent to alignment	16.3 acres; directly adjacent to alignment	16.9 acres; directly adjacent to alignment	14.8 acres; not directly adjacent to alignment
Land Use and Zoning	Residential; displaces approximately 182 dwelling units	Industrial; requires building demolitions	Industrial; requires building demolitions	Vacant; zoned commercial and industrial
Land Ownership	Private; requires public agency to displace residents	12% owned by County of Los Angeles Public Works	Private	Private
Buffers	Requires buffers	Requires buffers	Buffers unnecessary	Buffers unnecessary
Potential Expansion	Severely limited	Severely limited	Severely limited	Greatest potential
Community Disruption	High	Moderate	Moderate	Low
Pre-Emption of Most Valuable/ Best Use	Fair	Good	Good	Best

**ES.10 Alternatives Evaluated In This DEIS/DEIR**

**No-Build Alternative**

The No-Build or No Project Alternative is required to be discussed in all NEPA and CEQA environmental documents. The No-Build Alternative includes all existing highway and transit services and facilities, the current environmentally cleared or under construction Metro 2001 Long Range Transportation Plan committed highway and transit projects, and the SCAG’s 2008 Regional Transportation Plan (RTP) committed highway and transit projects.

Several projects that are unfunded in the Metro 2001 Long Range Transportation Plan or have not yet completed their environmental study are not included in the No-Build Alternative. These include Exposition Phase II, Westside Extension, and the Regional Connector.

The No-Build Alternative provides valuable information to the decision-maker and the public as it serves as a point of departure for evaluating transportation and environmental impacts of the other “build” alternatives.

**Transportation Systems Management (TSM) Alternative**

The TSM Alternative enhances the No-Build Alternative by expanding the Metro Rapid Bus services operating in the Crenshaw Transit Corridor. Under the TSM Alternative, a new Metro Rapid line would be added along Crenshaw Boulevard, La Brea Avenue, and Hawthorne Boulevard to complement the existing Metro Rapid Lines 710 and 740. The new Metro Rapid would operate from the Metro Purple Line Wilshire/Western Station to the Metro Green Line Aviation/LAX Station. It would operate along Wilshire and Crenshaw Boulevards, to Florence Avenue, and then along Florence Avenue and Aviation Boulevard to the Metro Green Line Aviation/LAX Station, located at the Aviation Boulevard/Imperial Highway intersection. The proposed new Metro Rapid Line would have the same stop locations on Crenshaw Boulevard as the Metro Rapid Lines 710 and 740. On Florence Avenue and Aviation Boulevard, the new Metro Rapid Line would have stops at West Boulevard, La Brea Avenue, Manchester Boulevard, Century Boulevard, and Imperial Highway at the Metro Green Line Aviation/LAX Station. The TSM Alternative does not include any additional improvements other than the projects included in the No-Build Alternative and expanded bus service.



*The No Build Alternative includes existing a funded projects in the Metro Long Range Plan. The baseline largely includes enhancements to existing local transit service .*

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**BRT ALTERNATIVE**



The TSM or Transportation Systems Management Alternative is required to be considered as an option by the Federal Transit Administration. TSM is intended to represent a low cost option to address needs in the corridor. The TSM Alternative for the Crenshaw Corridor involves improvements to existing Rapid Bus stops and the creation of a new Rapid Bus service along Florence Avenue and Aviation Boulevard.

The BRT Alternative considered in this Draft EIS/EIR is approximately 12 miles in length and provides service between the Metro Purple Line and the Metro Green Line. The BRT would operate in mixed traffic, and in semi-exclusive curb lane within Crenshaw Boulevard. It would operate in a dedicated busway on the Harbor Subdivision similar to the Metro Orange Line operations.

**BRT Alternative**

The BRT Alternative provides new transit services in the Crenshaw Transit Corridor, which would travel in mixed-traffic and in exclusive curb lanes. The BRT services would use low-floor, compressed natural gas (CNG) powered, articulated vehicles (i.e., a bus with two cabins rather than one), with multi-doors for boarding. Enhanced BRT stops and stations would be constructed for passengers to access the system. The BRT alignment would extend approximately 12 miles from the Metro Purple Line Wilshire/Western Station to the Metro Green Line

Aviation/LAX Station. The BRT Alternative includes 12 stations. As discussed below, the BRT Alternative, in various segments of the corridor, would operate under three conditions, in mixed traffic, in an exclusive lane and in a dedicated busway.

*Wilshire Boulevard/Crenshaw Boulevard Mixed-Traffic Lanes.*

The proposed new BRT route would begin at the Metro Purple Line Wilshire/Western Station. It would extend west operating in mixed-traffic lanes, from Wilshire Boulevard to Crenshaw Boulevard, with stations located at the Wilshire Boulevard/Western Avenue and the Wilshire/Crenshaw Boulevards

intersections. On Wilshire Boulevard, the existing Metro Purple Line Wilshire/Western Station and the Wilshire/Crenshaw Boulevards intersection stop would be used for BRT route access. A new BRT station/stop would be located on Crenshaw Boulevard, south of Wilshire Boulevard. From Wilshire Boulevard, BRT vehicles operate in mixed-traffic on Crenshaw Boulevard south to Exposition Boulevard (similar to existing Metro Rapid Bus operations).

BRT stations/stops would be located at Pico, Adams, and Exposition Boulevards. The BRT station at Exposition Boulevard allows transfers to the Metro Expo LRT Line (under construction). A Metro Rapid Bus extension or a BRT line from Exposition Boulevard/Crenshaw Boulevard and Wilshire Boulevard/La Brea Avenue would be implemented when the Metro Purple Line is extended west from Western Avenue.

*Crenshaw Boulevard Exclusive BRT Lanes.* On Crenshaw Boulevard, between Exposition Boulevard and the Harbor Subdivision, semi-exclusive BRT lanes would be provided in each direction, using the outside curb lane (except where exclusive BRT lanes would be built, as described below). During peak periods, the BRT service would operate in lanes restricted to buses and right-turning vehicles. During off-peak periods, the BRT vehicles would operate in mixed-traffic and in exclusive lanes restricted to buses and right-turn vehicles on the remaining sections.

**Exposition Boulevard to Rodeo Road** – Exclusive BRT lanes would be provided during peak periods by restricting the outside curb lanes to buses and right-turning vehicles, and prohibiting parking or general vehicle use during peak periods. As a result, the peak period general purpose traffic lanes would be reduced to two lanes in each direction. During off-peak periods, the BRT vehicles would operate in mixed-traffic in the inside traffic lane, and would not change current on-street parking provisions or the general traffic lanes available during off-peak periods.

**Rodeo Road to north of Martin Luther King Jr. Boulevard** – Exclusive BRT lanes would be provided during the peak and off-peak periods by reconstructing the street and using an undeveloped area within the existing right-of-way, along the east

side. The exclusive BRT lanes would be located along the outside curb lane and would be used by buses and right-turning vehicles only. The existing general traffic lanes would be maintained; however, on-street parking would be reduced, from both sides of the frontage roads to one side.

**From north of Martin Luther King Jr. Boulevard to Vernon Avenue** – Exclusive BRT lanes would be provided during peak periods by restricting the outside curb lanes to buses and right-turning vehicles, and by prohibiting parking or general vehicle use during peak periods. As a result, the peak period traffic lanes would be reduced to two lanes in each direction. During off-peak periods, the BRT vehicles would operate in mixed-traffic in the inside traffic lane, and current on-street parking provisions and general traffic lanes available during off-peak periods would remain as they are today.

**Vernon Avenue to West 60<sup>th</sup> Street** – Exclusive BRT lanes would be provided during peak and off-peak periods by reconstructing the street and using excess lane areas, or areas where frontage roads exist along the east and west sides. The exclusive BRT lanes would be located along the outside curb and be used by buses and right-turning vehicles only. The existing general traffic lanes would be maintained; however, on-street parking would be reduced from both sides of the frontage roads to one side.

**West 60<sup>th</sup> Street to Florence Avenue** – Exclusive BRT lanes would be provided during peak periods by restricting the outside curb lanes to buses and right-turning vehicles, and prohibiting parking or general vehicle use during peak periods. The peak period traffic lanes would be reduced to two lanes in each direction. During off-peak periods, the BRT vehicles would operate in mixed-traffic, in the inside traffic lane, and current on-street parking and the general traffic lanes available remain as is. BRT stations in this segment of Crenshaw Boulevard would be located at the Crenshaw/Martin Luther King Jr. Boulevards and the Crenshaw Boulevard/Slauson Avenue intersection. In addition, an optional station near the Crenshaw/Leimert Boulevards intersection would also be considered.

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## BRT ALTERNATIVE DETAIL

*Harbor Subdivision BRT Busway.* A BRT busway would be provided within the Harbor Subdivision right-of-way, from Crenshaw Boulevard south to the Aviation Boulevard/104<sup>th</sup> Street intersection, where the busway transitions to mixed-traffic operation. The BRT mixed-traffic operations continue from 104<sup>th</sup> Street and terminate at the Metro Green Line Aviation/LAX Station. The BRT Alternative assumes that the existing BNSF railroad tracks would be maintained. However, to accommodate a two-lane busway, the existing BNSF railroad track within the study area, would be relocated closer to the southern/eastern right-of-way line. The proposed busway would be located north and west of the relocated BNSF railroad track.

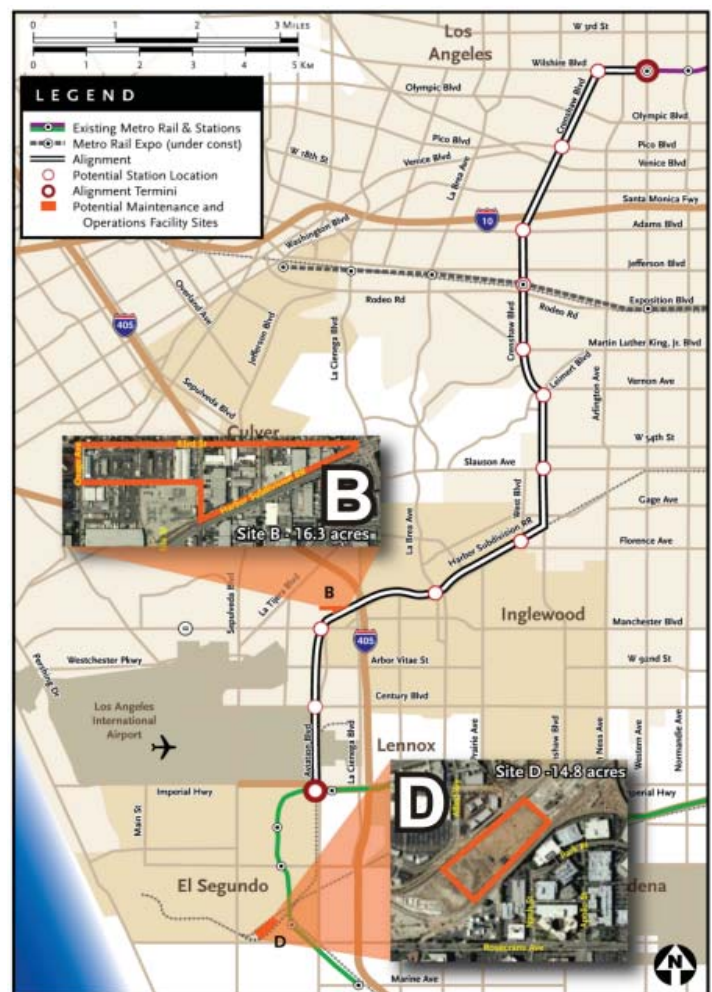
The BRT facility standards Metro used for the Metro Orange Line required a cross-section of 55 feet. This standard busway system would provide two 13-foot bus lanes separated by a 2-foot painted buffer line in the center of the busway and a relocated BNSF track. Because this cross-section could not be accommodated without acquiring additional right-of-way, a guided-busway system would be used to accommodate narrow bus lanes. Two 10.5-foot wide curbed bus lanes would be provided. A rubber guide following a raised curb on each side of the bus lane would guide the BRT vehicles. The busway would be separated from the relocated railroad track by a 1.5-foot wide barrier wall.

At the existing grade crossings, the railroad track would be protected by railroad gates and flashing lights. Between Crenshaw Boulevard and Imperial Highway, there are 19 at-grade BNSF railroad crossings within the Harbor Subdivision. These crossings would be modified to accommodate the busway crossing. Busway lanes would increase from 10.5 feet to 12 feet wide at these crossing. Without the widening, the raised curbs for the guided BRT vehicles would not be able to continue through the crossings. Traffic signals would control the busway crossings, rather than railroad gates and flashing lights. The wider busway and railroad gate setback requirements would require the acquisition of approximately six feet of additional right-of-way at these crossings.

BRT stations would be located approximately one-mile apart. The BRT stations would be at-grade and comprised of two separate platforms, one for each travel direction. The station platforms

would accommodate three conventional (40- to 45-foot long) buses or two articulated (60-foot long) buses. The BRT platforms would accommodate low-floor vehicles to improve the boarding and alighting process and help reduce vehicle travel times. BRT stations along the Harbor Subdivision would be located at West Boulevard, La Brea Avenue, Manchester Boulevard, and Century Boulevard. A station is also proposed at the Metro Green Line Aviation/LAX Station. If implemented, passengers would be able to transfer to the proposed LAX “people mover” (planned to be constructed and operated by the airport) at the Century Boulevard Station.

*Supporting BRT Facilities.* A new maintenance and operations facility would be required to accommodate the expanded vehicle fleet under the BRT Alternative. The facility would be a stand-



This environmental report considers the impacts at two candidate maintenance yard sites. Site B is located in Westchester and Site D is located in El Segundo.

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alone facility for BRT vehicle service and maintenance/storage area for vehicles not in service. The facility would ultimately be large enough to support approximately 100 to 300 buses. The ultimate facility size would be determined after the project's operating plan is finalized. The figure above shows the two proposed maintenance and operations facility sites being evaluated. These two sites are also being evaluated for the LRT Alternative.

### Base LRT Alternative

The Base LRT alignment would extend approximately 8.5 miles from the Expo LRT Line at the Crenshaw/Exposition Boulevards intersection to the Metro Green Line Aviation/LAX Station. The LRT alignment would be double-tracked and would consist of four components, at-grade street, at-grade railroad, aerial, and below-grade sections.

*Crenshaw Boulevard Alignment.* The proposed LRT alignment northern terminus would be located east of Crenshaw Boulevard, where it would connect with the Expo LRT Line. The Expo LRT Line would have a split, side platform station with the westbound platform located on the east side of Crenshaw Boulevard and the eastbound platform located on the west side of Crenshaw Boulevard. Because the split platform station would not provide convenient passenger transfers between the Crenshaw and Expo LRT Lines, it is proposed that the station be modified under the Base LRT Alternative to a single, center platform station located on Exposition Boulevard east of Crenshaw Boulevard. The present station location would be shifted east to provide the Expo LRT Line track connection. A pocket track would be provided east of the station for Crenshaw LRT Line trains to reverse direction.

From the Exposition/Crenshaw station, the proposed LRT alignment would turn south along the Crenshaw Boulevard east side and would cross the northbound lanes, north of Rodeo Road, to the center of Crenshaw Boulevard. There would be a traffic signal at the Crenshaw Boulevard/Rodeo Road intersection to control traffic. A new median would be constructed for the double-track LRT alignment. To maintain the existing traffic lanes on Crenshaw Boulevard, the east side of the street would be

## LRT ALTERNATIVE

widened south to Rodeo Place.

The alignment would continue south, at-grade, in a new median on Crenshaw Boulevard to approximately West 39<sup>th</sup> Street where the alignment would transition to below-grade. The portal for the transition would be approximately 600 feet long.

After transitioning to below-grade, the LRT alignment would continue below-grade south along Crenshaw Boulevard. A below-grade station would be located at Martin Luther King Jr.



*Base LRT Alignment.* The Base light rail route is approximately 8.5 miles in length. It extends from the Exposition Light Rail line to the Green Line. This baseline option includes at grade, below grade and elevated sections as shown above.



Boulevard. Between Leimert Boulevard and West 48<sup>th</sup> Street, the alignment would transition from below-grade to at-grade in the center of the street, and would continue at-grade to West 59<sup>th</sup> Street. Crenshaw Boulevard would be reconfigured to minimize the width of the frontage roads by eliminating parking on one side of each frontage road. An at-grade station would be located south of Slauson Avenue.

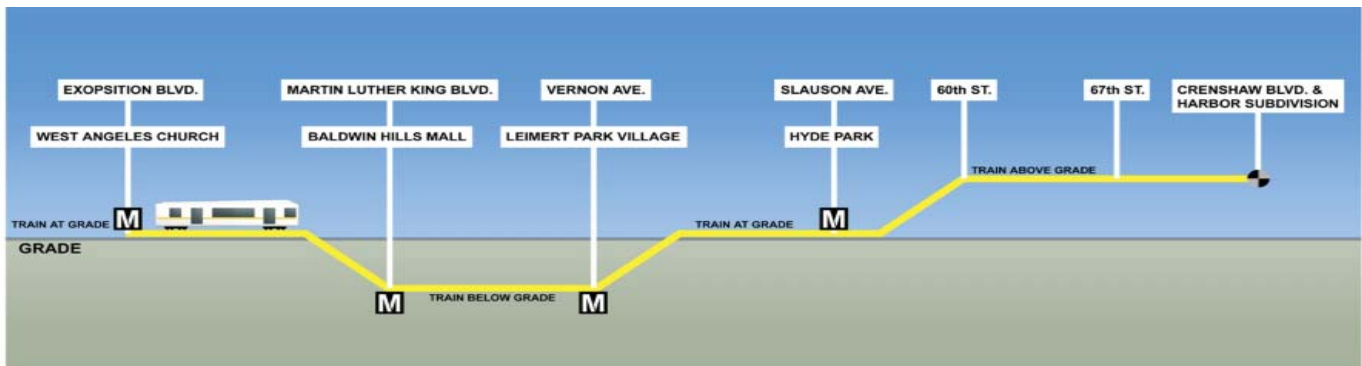
The Base LRT alignment would be on an aerial structure south of West 60<sup>th</sup> Street due to insufficient street width of 100 feet. The alignment would transition from at-grade to aerial between West 59<sup>th</sup> and West 60<sup>th</sup> Streets, and would continue on an aerial structure south to the Harbor Subdivision.

Stations would be located at Crenshaw/Martin Luther King Jr., and Crenshaw/Slauson Avenue. The Crenshaw/Exposition station would result in modifying the Expo LRT Line Crenshaw Station to a center platform station design under the Base LRT Alternative.

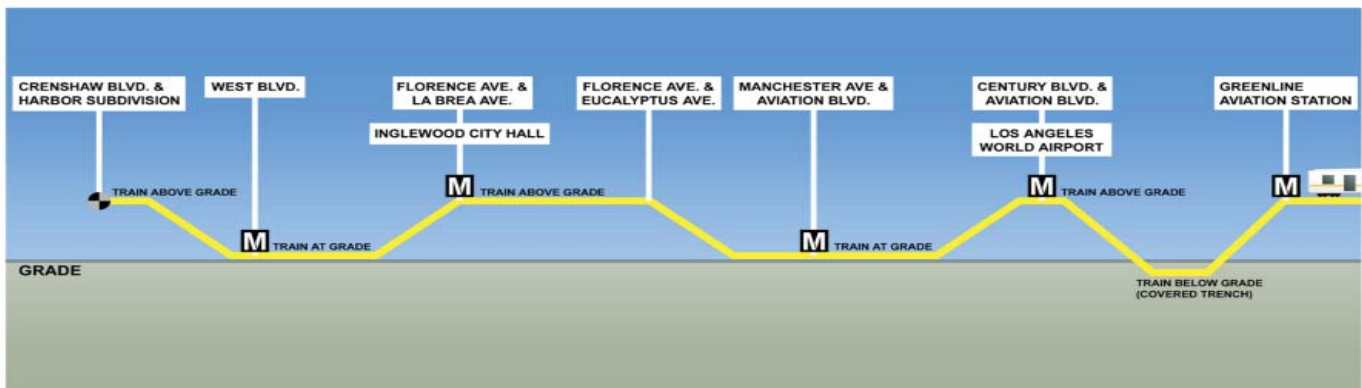
*Harbor Subdivision Base LRT Alignment.* From Crenshaw Boulevard, the proposed aerial LRT alignment would turn west onto the Harbor Subdivision right-of-way. The aerial LRT alignment would continue west of Victoria Avenue, where it would transition to at-grade. An at-grade station would be located west of West Boulevard.

The alignment would continue at-grade east of La Brea Avenue, where it would transition to an aerial LRT. An aerial station would be located just west of La Brea Avenue (directly over the BNSF railroad track) with a mezzanine for a potential connection to a pedestrian bridge over Florence Avenue. This would serve the Inglewood Civic Center and shopping complex. The aerial alignment would continue west of Eucalyptus Avenue, where it would descend to at-grade.

The LRT alignment would continue at-grade to approximately Hyde Park Boulevard, where it would transition to an aerial configuration across the I-405 and La Cienega Boulevard. The



EXPOSITION BLVD. TO HARBOR SUBDIVISION



HARBOR SUBDIVISION TO GREENLINE AVIATION STATION

Vertical Profile of the Base LRT Alignment. As shown about one third of the Base LRT alignment is grade separated.

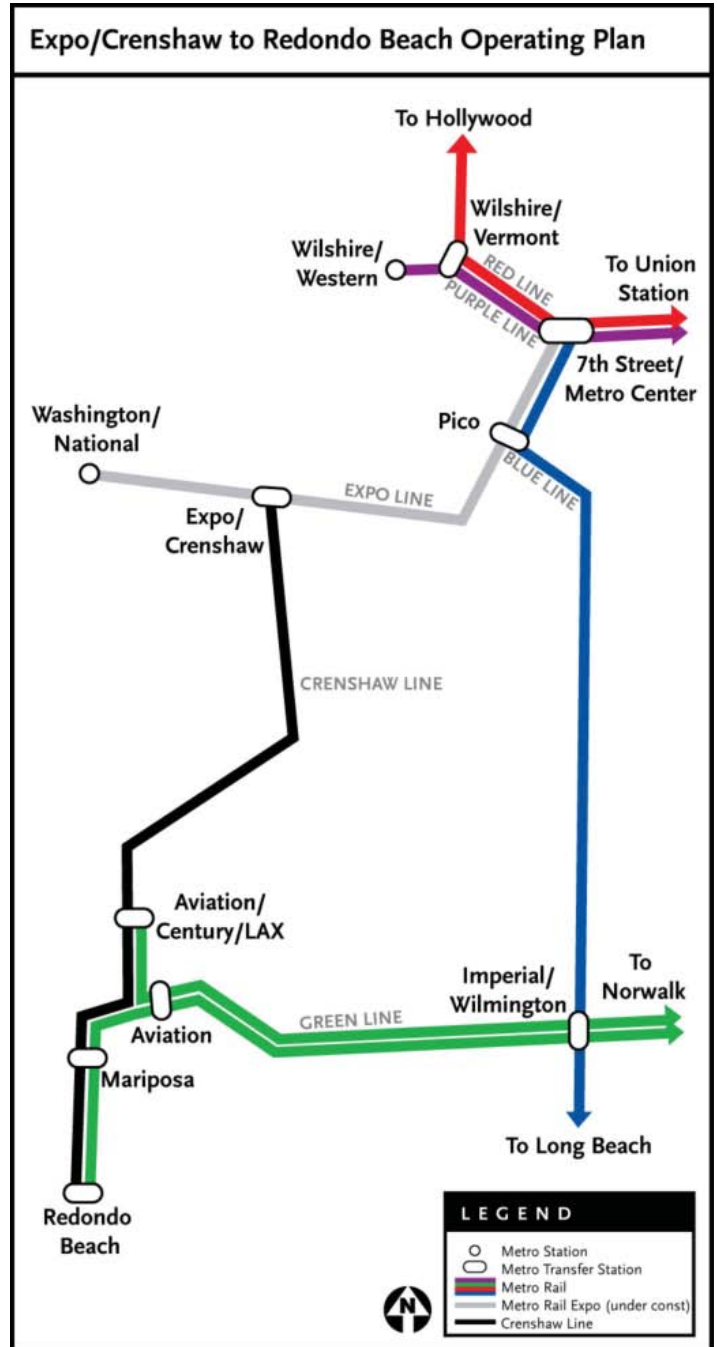
LRT alignment would return to at-grade west of La Cienega Boulevard, where there would be an at-grade station west of Hindry Avenue (i.e., the Aviation/Manchester Station). The alignment would continue at-grade to the Aviation/Century Station, near the 96<sup>th</sup> Street/Aviation Boulevard intersection. This station would provide transfers to the planned LAX people mover.

The alignment would transition to an aerial configuration north of Century Boulevard. At Century Boulevard, the LRT alignment would continue via a new bridge constructed west of, and adjacent to, the existing railroad bridge. After crossing Century Boulevard, the LRT alignment would descend to below-grade, primarily within Metro owned right-of-way, and would continue south beyond the LAX south runways. This segment of below-grade alignment is subject to a determination of necessity by the Federal Aviation Administration (FAA). Approximately 20 feet of additional right-of-way or easement would be required in some sections either through acquisition or easement.

South of West 111<sup>th</sup> Street, the alignment would transition to an aerial configuration, where it would join the existing Metro Green Line. At the Metro Green Line junction, the LRT alignment could proceed east and enter the Aviation/Imperial (existing Aviation/LAX) Station or proceed west and continue to the existing Metro Green Line Redondo Beach Station at Marine Avenue.

The LRT Alternative operation would provide for a single LRT line providing service from the Exposition/Crenshaw Station in the north to the Redondo Beach Station on the existing Metro Green Line in the south. Operation would follow new infrastructure along Crenshaw Boulevard and the Harbor Subdivision and join the existing Metro Green Line just west of the existing Aviation Station near Imperial Highway.

The LRT Alternative will also involve a new extension of the Metro Green Line to the north to serve the new Aviation/Century Station for connections to Los Angeles International Airport (LAX). A new service pattern will extend between Norwalk and Aviation/Century.



LRT operation will involve a single service from Exposition/Crenshaw to Redondo Beach Station along new infrastructure and the Metro Green Line. New Metro Green Line service north toward an airport connect (with LAX's proposed "automated people mover") at Aviation/Century will be facilitated.



*The Crenshaw LRT Alternative would travel southbound to Aviation and Imperial where it would continue south, connecting with the existing Metro Green Line, with service to the Mariposa, El Segundo, Douglas and Redondo Beach Green Line stations. Here the Metro Green Line is shown at Maple Street, just north of the Mariposa Station.*

**Stations and Station Parking.** The Base LRT Alternative would include stations for passenger access. Seven new stations would be provided including Crenshaw/Exposition, Crenshaw/Martin Luther King Jr., Crenshaw/Slauson, Florence/West, Florence/La Brea, Aviation/Manchester, and Aviation/Century. LRT station types would be at-grade, aerial, or below-grade, and would be comprised of 270-foot long platforms that accommodate LRT trains with up to three cars. All platforms would be fully accessible and comply with the Americans with Disabilities Act (ADA). Outdoor platforms would be well-lighted and include amenities, such as canopies that cover a minimum 30 percent of the platform area, seating, bike lockers, bike racks, trash receptacles, and artwork. The stations at Crenshaw/Exposition Boulevards, Crenshaw/Martin Luther King Jr. Boulevards, Harbor Subdivision/La Brea Avenue, and Harbor Subdivision/Manchester Avenue would include park-and-ride lots. The park-and-ride lots at Crenshaw/Exposition Boulevards and Crenshaw/Martin Luther King Jr. Boulevards would be shared with adjacent businesses/civic uses.

**Supporting LRT Facilities.** The Base LRT Alternative construction would include installing trackwork, an overhead contact system (OCS) distributing electricity to light rail vehicles (LRVs), traction power substations (TPSS) located about one mile apart, signaling

and communication systems, and a vehicle maintenance and operations facility which would operate 24 hours a day, seven days a week.

**Systems:** The LRT fixed guideway would consist of continuously welded rails. The rails would be embedded in a concrete slab or installed on crossties and ballasts. The LRT OCS would consist of steel poles installed along the operating right-of-way to support the electrical power line. The poles would be approximately 25-foot tall and would be installed at 90 to 170 feet intervals. The poles would generally be located in the center of the right-of-way, between the two tracks, wherever possible. In some locations, the poles would be located on both sides of the LRT tracks. The overhead electrical power lines are suspended above the LRT tracks. Electricity for LRT operations would be supplied to the OCS from traction power substations (TPSS), located along the proposed LRT alignment. These electrical substations would be enclosed structures located near the LRT alignment. Development of the substations, in some cases, would require an access roadway for maintenance vehicles. Electrical substations would be required for approximately each mile of single or double-track. Communications and signaling (C&S) buildings house train control and communications for LRT operations in a central facility at each station. Each facility is an enclosure located within the station site area, typically adjacent to a station platform. Positioning of a C&S building must be done to provide clearances for maintenance and servicing, and to maintain sight lines for LRT operations.

**Maintenance and Operations Facility:** The Base LRT Alternative would require a new maintenance and operations facility. The facility would be a stand-alone facility for LRV service and maintenance and storage for vehicles that are not in service. The facility would operate 24 hours a day, seven days a week.

*What is an Overhead Contact System? A distinctive feature of LRT is that the vehicles draw power from overhead wires, known as the overhead contact system (OCS). This allows LRT systems to be integrated with other at-grade transportation modes, such as automobiles and pedestrians.*

The facility would ultimately be large enough to support approximately 60 vehicles. The ultimate facility size would be determined after the project operating plan is finalized. The two proposed maintenance and operations facility sites evaluated are shown below.



Candidate maintenance yard sites for LRT are the same as those sites being considered for BRT.

*A Maintenance and Operations Facility is necessary to ensure that the project can continue to function on a daily basis without service interruptions or delay. These activities include the maintenance needed to keep the transit vehicles in peak operating condition, as well as emergency repairs necessary if a vehicle becomes inoperable. Storage is necessary for the vehicles when they are not in operation and are being repaired, or for replacement vehicles that become temporarily inoperable.*

**ES.11 Additional LRT Alternative Design Options**

Six additional LRT Alternative design options are being considered in this environmental document as variations to the Base LRT Alternative. These design options were developed in response to public and agency input and may be included as part of the preferred LRT Alternative based upon results of environmental analysis and further public comment. These design options include the following:

**Design Option 1.** LRT Alternative Design Option 1 involves an aerial station design option for the Aviation/Century station on the north side of Century Boulevard as compared to the Base LRT Alternative at-grade station located approximately 1,500 feet north of Century Boulevard near 96<sup>th</sup> Street.



Design Option 1 considers whether the proposed LRT station at Aviation/Century should be elevated and be located closer to Century Boulevard.

**Design Option 2.** LRT Alternative Design Option 2 involves an aerial crossing rather than an at-grade crossing at Manchester Avenue. An aerial crossing over Manchester Avenue would replace the at-grade LRT alignment proposed under the Base LRT Alternative and would extend an aerial alignment approximately 1,300 feet within the Harbor Subdivision. The over crossing would consist of an 800-foot bridge and 250-foot approaches on each bridge. The aerial alignment would return to grade on the north side of Manchester Avenue before the at-grade station proposed on the north side of Hindry Avenue. A final decision on including this aerial crossing in the LRT Alternative would be dependent on further traffic analysis, and an evaluation of the grade separation analysis. The grade separation analysis, required by Metro’s Grade Separation Policy, is a review of physical conditions at the site, and a cost evaluation.

LRT ALTERNATIVE DESIGN OPTIONS



LRT Design Option 2 addresses whether an elevated crossing above Manchester Avenue is necessary to preserve efficient traffic flow during LRT operations.

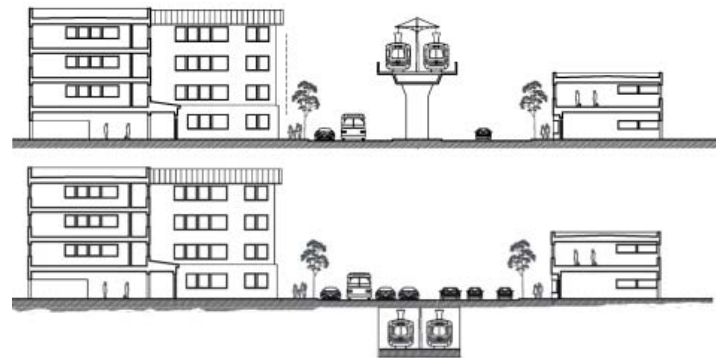
**Design Option 3.** LRT Alternative Design Option 3 involves a cut-and-cover crossing instead of an at-grade crossing at Centinela Avenue. An LRT under-crossing at Centinela Avenue would replace the at-grade LRT alignment proposed under the Base LRT Alternative and would extend approximately 2,000 feet within the Harbor Subdivision. The under-crossing would consist of a 200-foot long bridge with a 700-foot depressed LRT alignment section on the west and an 1,100-foot depressed section on the east side of Centinela Avenue. A final decision on inclusion of this Centinela Avenue under-crossing design option in the LRT Alternative would be dependent on further traffic analysis and an evaluation of the grade separation analysis required by Metro’s Grade Separation Policy. An aerial design option at Centinela Avenue was also evaluated, but was eliminated from further consideration as a result of the high cost and visual impacts.



LRT Design Option 3 considers the effects of creating a grade separation at the Harbor Subdivision and Centinela Avenue. This crossing is at grade in the Base LRT Alternative, however, there are adjacent land uses such as a nearby school, and park that generate pedestrian traffic that would have to cross the LRT line.

**Design Option 4.** LRT Alternative Design Option 4 involves a cut-and-cover alignment instead of an aerial alignment between

Victoria Avenue and 60<sup>th</sup> Street. A below-grade alignment between South Victoria Avenue and 60<sup>th</sup> Street would replace the aerial alignment proposed under the Base LRT Alternative, starting on Crenshaw Boulevard and extending into the Harbor Subdivision. The below-grade alignment would be built as a cut-and-cover tunnel.



Design Option 4 is an option to avoid the visual effects of the elevated structure in the median of Crenshaw Boulevard, as well as the loss of travel lanes. The Design Option would place the LRT below grade and maintain the existing traffic lanes on Crenshaw Boulevard.



To eliminate the visual effects of an elevated LRT structure within the median of Crenshaw Boulevard, Design Option 4 considers below grade alignment from 60th street to Victoria Avenue.

**Design Option 5.** LRT Alternative Design Option 5 involves a below-grade station at Vernon Avenue in Leimert Park. The Crenshaw/Vernon station is an optional below-grade station. If the optional station at Crenshaw/Vernon is not included in the selection of the LPA, consideration will be given to shifting the Crenshaw/Martin Luther King Jr. Station to between Martin Luther King Jr. Boulevard and Stocker Avenue to improve pedestrian access to Leimert Park Village. The result is two scenarios for LRT stations in this area: (1) One station (Base LRT Alternative) – the Crenshaw/Martin Luther King Jr. Station lies

# CRENSHAW TRANSIT CORRIDOR DRAFT EIS/EIR

## Executive Summary

# ISSUES TO BE RESOLVED - COMMUNITY ACCEPTANCE

closer to Stocker Avenue and (2) Two stations (LRT Alternative with Design Option 5) – a Crenshaw/Martin Luther King Jr. Station and a Crenshaw/Vernon Station. These two stations would be within half a mile distance of each other.



LRT Design Option 5 considers the feasibility of maintaining two stations in close proximity at Crenshaw/King and at Crenshaw/Vernon. The Crenshaw/Vernon station is the optional station.

**Design Option 6.** LRT Alternative Design Option 6 involves a below-grade alignment between 39<sup>th</sup> Street and Exposition with a below-grade station at Crenshaw Boulevard and Exposition Boulevard. A below-grade alignment between 39<sup>th</sup> Street and Exposition Boulevard would replace the at-grade Base LRT Alternative alignment and would extend the tunnel north of Martin Luther King Jr. Boulevard to Exposition Boulevard with a below-grade station. The below-grade station would provide street level access for transferring to the Exposition LRT. The below-grade alignment could be built as a bored tunnel. A final decision on a below-grade alignment would be dependent on further analysis of environmental impacts and cost evaluation.



To reduce potential traffic conflicts at Exposition and Crenshaw and to avoid right-of-way conflicts with a proposed development along Crenshaw Boulevard between Rodeo Road and Coliseum Street, LRT Design Option 6 considers a below grade alignment along Crenshaw Boulevard between Exposition and 39th Street.

## ES.12 Issues to be Resolved

Based on the outcome of the alternatives analysis and screening process and technical transit planning considerations, in addition to input received during the interagency coordination process, a series of issues (listed below) that remain to be resolved have been identified. These issues must be addressed and resolved as the project moves forward through the DEIS/DEIR process and to the selection of a LPA by the Metro Board.

### Community Acceptance of the TSM and BRT Alternatives as a Credible Mobility Improvement Over Existing Metro Rapid Bus Service as the Long Term Investment

Crenshaw Boulevard currently features Metro Rapid Bus service that supplements local bus service along the corridor. The TSM and BRT Alternatives described in the DEIS/DEIR distinguish small incremental travel time improvements over the existing service. Existing bus service and future options are subject to traffic delays as a portion of these services will have to operate in mixed traffic. The Metro Board will have to consider whether these options are viable long-term solutions to mobility needs in the Crenshaw Corridor.



Community Meeting.

#### Crenshaw Transit Corridor Connection to the Metro Purple Line/ Metro Purple Line Extension

As presented in the DEIS/DEIR, all of the build alternatives provide a bus connection to the Metro Purple Line Wilshire/Western subway station. This bus connection is achieved through service in mixed traffic and, as a result, the reliability of the connection travel time is subject to traffic congestion and delays. When the Metro Purple Line is extended westward, then the future connection options from the Crenshaw Corridor should be accounted for. The Alternatives Analysis process conducted for the Crenshaw Corridor screened out a LRT connection to the Metro Purple Line due to cost effectiveness considerations. The connection would have to be entirely underground due to the narrow right-of-way on Crenshaw Boulevard, making the option cost prohibitive. If a connection is to be achieved between a Crenshaw Corridor LRT Alternative and the Metro Purple Line, a Metro feasibility study has found that an LRT connection towards the west, such as the Wilshire Boulevard/La Brea Avenue intersection rather than Crenshaw/Wilshire Boulevards intersection would be the most attractive option. Metro Board deliberation of the Crenshaw Corridor LRT Alternative and of the related Westside Extension Project should consider measures that would not pre-empt this future connection. Implementation of the TSM or BRT alternatives may also consider re-alignment of routes to serve Wilshire/La Brea upon implementation of the Westside Extension Project.



*Metro Purple Line Connection at Wilshire/Western Station for the BRT Alternative.*

#### Crenshaw Transit Corridor Light Rail Alternative Connection to the Exposition Light Rail

The Base LRT Alternative under consideration would cross the Exposition Light Rail Line at-grade. This type of crossing would have the potential to create severe traffic delays during peak periods when both lines would operate at high train frequencies. The at-grade connection would also require that the Exposition platform be rebuilt and extended. Grade separation of the crossing between the two lines would reduce traffic flow considerations and eliminate the expense of the platform rebuild. The only viable grade separation would be to bring the Crenshaw LRT underground at Exposition. This would introduce a different set of construction impacts associated with building an underground station. The Metro Board will have to consider the extent of the underground Crenshaw LRT segment. The DEIS/DEIR considered a design option to extend the underground segment from Exposition Boulevard to 39<sup>th</sup> Street. The effect of this option would create a below-grade segment that extends from Exposition Boulevard to 48<sup>th</sup> Street, a distance of approximately 1.5 miles. This would increase project costs.



*Expo Line Connection.*

*What is an at-grade crossing? An intersection of railroad tracks, roads, walkways, or a combination of these at the same surface level.*

# CRENSHAW TRANSIT CORRIDOR DRAFT EIS/EIR

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### ISSUES TO BE RESOLVED - STATIONS AND TUNNELING METHODS

#### Light Rail Station Area Development Potential Consistent with Community Goals and Objectives

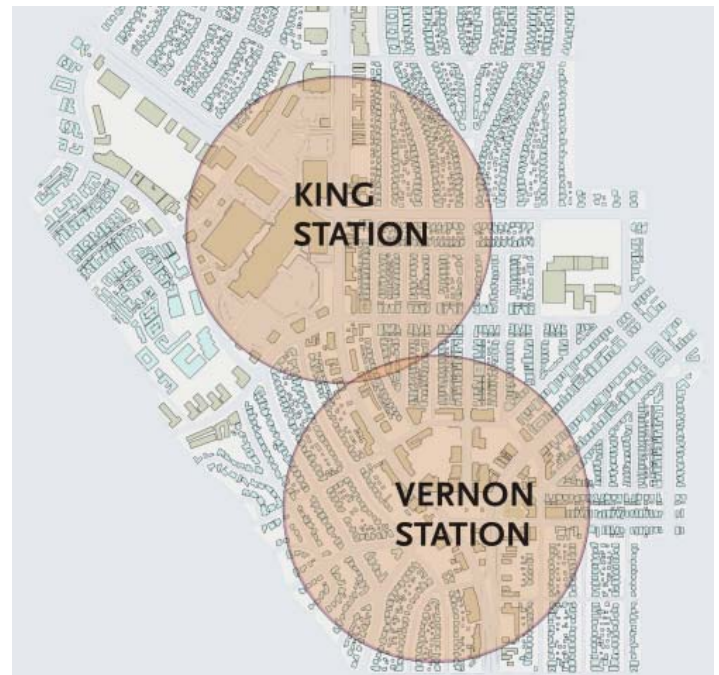
One key aspect in obtaining federal funding for transit improvements is whether local communities encourage transit-supporting or transit-oriented land uses. Similarly, California, with impetus from Senate Bill 375, has also focused on transit-supporting land uses as a means to reduce greenhouse gas emissions. Transit-supporting land uses often result in an increase in development density and intensity. The Metro Board must weigh Federal and State mandates against community concerns regarding over-development or changes in the character of corridor communities. Although all proposed station areas are subject to this concern, Leimert Park Village residents in particular have expressed concern about increased development.

station locations are approximately 1/2-mile apart. An additional station would increase LRT travel times.

As proposed with the Design Option, one station would serve the Baldwin Hills Crenshaw Plaza shopping center and the other would serve Leimert Park Village. The Metro Board should consider whether two stations are necessary and whether the added expense of a Leimert Park Station (near Vernon Avenue) is warranted. Since the alignment is underground at this location, the cost of an additional station is more significant. Public comments received expressed concern about the intensity of new development that may be attracted to Leimert Park Village if there is an adjacent station.



Potential changes to Leimert Park Village that may be induced by a nearby light rail station have emerged as a local concern.



Station Proximity.

#### Light Rail Station Location(s) Between Martin Luther King Jr. Boulevard and Vernon Avenue

Related to the issue of transit-supporting land use and induced growth is the pending location of the LRT station between Martin Luther King Jr. Boulevard and Vernon Avenue. The LRT Alternative indicates two below-grade LRT stations; a station at Martin Luther King Jr. Boulevard and an optional station at Vernon Avenue, adjacent to Leimert Park. These prospective

#### Light Rail Underground Construction Method Between 39th Street and 48th Street

One of the most disruptive forms of underground transit construction is the cut-and-cover method. This method requires excavation of the underground trench, and then temporarily covering the trench with wooden planks or concrete or metal panels while the subway is constructed beneath. In the section



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of Crenshaw Boulevard between 39<sup>th</sup> Street and 48<sup>th</sup> Street, this construction technique would likely have adverse effects on traffic flow and to the accessibility for local businesses. The tunnel-boring technique would be less disruptive to the community, but requires stations to be located deeper than with the cut-and-cover method. This technique involves an underground machine that creates the subway structure without disrupting the surface. The Metro Board must consider whether tunnel boring is a viable option for this segment. Typically short segments are not cost-effective; however, if the underground LRT segment extends from 39<sup>th</sup> Street to 48<sup>th</sup> Street to address the Exposition LRT/Crenshaw LRT grade separation, then tunnel boring may be economically feasible. It is important to note that even if tunnel boring is feasible, the Crenshaw/Martin Luther King Station and the optional Crenshaw/Vernon Station would continue to be constructed through the cut-and-cover technique.



*Cut and Cover Construction Gold Line Eastside Extension.*

### Light Rail Northern Portal Location and Baldwin Hills Crenshaw Plaza Access

The Base LRT Alternative would transition into an underground alignment near (immediately to the north of) 39<sup>th</sup> Street. Access to the Baldwin Hills Crenshaw Plaza is south of 39<sup>th</sup> Street. Future redevelopment plans for the plaza may place an even greater emphasis on access and circulation at the 39<sup>th</sup> Street location. The placement of the underground portal will be an important consideration that may affect the future operations of the plaza.

## ISSUES TO BE RESOLVED - FITTING WITHIN CRENSHAW BOULEVARD



*The Base LRT Alternative would have a portal to transition from surface level to below surface near 39th Street. There are a number of adjacent land uses that would be affected by this transition area.*

### Treatment of Frontage Roads and Parking From Coliseum to Martin Luther King Jr. Boulevard and from 48<sup>th</sup> Street to Slauson Avenue

In a number of segments along Crenshaw Boulevard, north of Slauson Avenue, the street features one-way frontage roads that are separated from the main traffic lanes of Crenshaw Boulevard by a raised median. To maintain the current number of traffic lanes and to accommodate LRT or BRT in semi-exclusive rights-of-way, the frontage roads would be reconfigured or eliminated.



*In a number of sections Crenshaw Boulevard features one-way service or frontage roads that serve adjacent businesses and provide parking out of the main traffic flow of Crenshaw Boulevard. These frontage would be affected by the at-grade segments of the LRT proposal.*

This change has implications for the loss of curb parking along Crenshaw Boulevard, convenient access to Crenshaw Boulevard businesses, and alteration in street landscaping. Public input through the urban design and station area planning process will be necessary to fully reveal community and business concerns and identify acceptable solutions.

#### **Streetscape and Urban Design Treatments to Mitigate the Loss of Mature Median Trees Between 48<sup>th</sup> Street and 54<sup>th</sup> Street.**

Since the 1960s (after the termination of the streetcar service on Crenshaw Boulevard), the median of Crenshaw Boulevard has been landscaped from 48<sup>th</sup> Street to 54<sup>th</sup> Street. Along this section of the Crenshaw Boulevard median are intervals of mature trees that provide visual relief from the wide Crenshaw Boulevard right-of-way and provide a landscape underpinning supporting Crenshaw Boulevard's designation as a scenic highway by the City of Los Angeles for the section north of Slauson Avenue. LRT improvements in this section of Crenshaw Boulevard would require the removal of these trees. At issue is whether there are urban design and landscaping options that will effectively mitigate this visual loss. Plans for the LRT Alternative in this section currently propose widening of sidewalks with additional landscaping for pedestrians. The DEIS/DEIR anticipates that community input during station area planning exercises will provide a firm basis to provide adequate mitigation and resolution of this issue.



*Mature Trees In Crenshaw Median. Trees were planted along the median of Crenshaw Boulevard when the original Yellow Car transit line was removed. Over the years these trees have matured and the current LRT proposal would remove this landscaping and provide additional landscaping along a widened sidewalk.*

#### **Pedestrian Safety Improvements at Nearby Schools**

A number of private and public schools are either adjacent to or near Crenshaw Boulevard. There is also a private school near the Harbor Subdivision and Centinela Avenue crossing. The Metro Board will need to consider whether additional pedestrian safety measures are warranted, beyond Metro's current pedestrian safety program.



*Schools adjacent to the LRT raise the awareness regarding pedestrian safety and measures that must be in place to ensure safe LRT operations and pedestrian paths.*

#### **Effective Urban Design and Structure Design Treatments to Mitigate the Impact of an Elevated Structure Between 60<sup>th</sup> Street and the Harbor Subdivision**

The Base LRT Alternative includes construction of an aerial/elevated structure within the median of Crenshaw Boulevard between 60<sup>th</sup> Street and the Harbor Subdivision railroad. The aerial trackbed structure would be located on columns spaced at intervals within the street. It is anticipated that the columns would be at least 8 feet in diameter and the structure would be over 20 feet in height. Catenary poles necessary to supply power to the LRT system would be mounted atop the structure and would extend the overall height of the elevated guideway to over 30 feet. The placement of this type of structure within the middle of Crenshaw Boulevard will result in a marked change in visual character. Overall, Crenshaw Boulevard may appear to be

**ISSUE TO BE RESOLVED - CONNECTIONS NEAR INGLEWOOD**

narrower, there would be shaded and shadowed areas, and the placement of columns would limit sight distances for motorist and pedestrians.



*Aerial station rendering.*

Outside of the design option to place the LRT alignment underground, it is anticipated that community input will be focused on methods and measures to reduce the visual effect of the structure to a point where community consensus is achieved. The Advanced Conceptual Engineering (ACE)/Preliminary Engineering (PE) phase would address these issues if the Base LRT Alternative is selected as the LPA. Specifically, the PE phase would identify urban design solutions including design options for the structure, lighting, solar access, landscaping and architectural and artistic treatments.



*Illustrative view of elevated LRT structure near Crenshaw at 60th Street.*

### West Boulevard Station Location

Under the Base LRT Alternative, a station is located west of West Boulevard in the City of Inglewood. Community input received from residents in the Hyde Park community favor moving the station eastward toward Crenshaw Boulevard to provide a better connection with transit services on Crenshaw Boulevard and on Florence Avenue potentially providing improved access from communities to the south along Crenshaw Boulevard, such as Morningside Park. Such a location may provide for revitalization along a corridor between Crenshaw Boulevard and West Boulevard. Some community residents in the City of Inglewood favor the continued location of the station west of West Boulevard, where there may also be transit-oriented development opportunities on vacant parking lots and other under-utilized parcels. The potential location of a station adjacent to West Boulevard also could be perceived as a catalyst to change along West Boulevard that has remained dormant for many years.



*Crenshaw Corridor.*

### Connection to Hollywood Park Redevelopment

As discussed above, Metro received comments during meetings in the City of Inglewood that the alignment should be re-directed to serve the City of Inglewood's focus and investment in the Hollywood Park area. Metro reviewed ridership and cost data and concluded that the proposed Base LRT alignment along the Harbor Subdivision that does not directly connect to the Hollywood Park Redevelopment area remains the most viable and cost-effective option. The Base LRT alignment serves

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### ISSUES TO BE RESOLVED - RAILROAD COORDINATION

downtown Inglewood employment with a proposed station at La Brea Avenue. The issue remains, however, as to how Hollywood Park can be connected to light rail, perhaps through enhancement of local transit connections or coordination with local developers regarding the provision of shuttle service.



*Hollywood Park Redevelopment. Within the City of Inglewood, the Hollywood Park area is undergoing a major change with housing and retail developments expected to replace the race track. Transit connections to this emerging area is a major local concern.*

### Burlington Northern Santa Fe Use of the Harbor Subdivision Railroad

One of the most significant constraints to transit use of the Harbor Subdivision is the issue of whether Burlington Northern Santa Fe (BNSF) will maintain railroad operations within the right-of-way. Maintaining BNSF operations in the Harbor Subdivision would require the relocation of the railroad tracks to allow for either BRT or LRT operations. The continued use by BNSF also adds to construction cost, as well as a new element to grade crossings, where there would be crossing signals for either the LRT or BRT vehicles and a separate signal system for railroad operations. Metro has had discussions with BNSF to determine whether the abandonment (during construction and/or permanently) of the Crenshaw Corridor portion of the Harbor Subdivision (Crenshaw Boulevard to Imperial Highway) is possible.



*Harbor Subdivision. Continued freight use of the Harbor Subdivision poses many constraints to the development of both BRT and LRT transit service within the railroad right-of-way.*

### Metro Harbor Subdivision Alternatives Analysis Study

The long term use of the Harbor Subdivision railroad right-of-way is currently being studied by Metro. Decisions related to the Crenshaw Corridor Transit Project will have an effect on future planning for the entire Harbor Subdivision. The Metro Board, in its deliberation on the Crenshaw Corridor Transit Project, will need to consider opportunities and limitations that may be imposed on connections to the South Bay and more broadly the entire railroad corridor from downtown Los Angeles to the harbor area.

*What is the Harbor Subdivision? The Harbor Subdivision is a freight rail corridor, approximately 26 miles in length, that traverses southwest Los Angeles County from Vernon to Wilmington. In the early 1990s, Metro purchased the portion of the corridor between Redondo Junction and Watson Yard, along with several other rail rights-of-way, to further the development of the region's rapid transit system. Metro has initiated an Alternatives Analysis Study (AA) for the Harbor Subdivision Transit Corridor. The study will examine potential transit service along the Metro-owned Harbor Subdivision.*

**ISSUES TO BE RESOLVED -  
 RIGHT-OF-WAY  
 CONSIDERATIONS**



The Harbor Subdivision Alternatives Analysis explores many alternatives between downtown Los Angeles and the harbor area via South Los Angeles, LAX, and the South Bay. The Crenshaw Corridor may affect or enable future projects along the Harbor Subdivision.

**Grade Separation at Centinela Avenue**

The application of Metro’s Grade Crossing Policy is presented in the conclusions of the DEIS/DEIR. At this stage in the analysis, the assessment concludes that no grade separation is needed at Centinela Avenue and the Harbor Subdivision adjacent to Florence Boulevard. Comments received through the community outreach process indicated community concerns regarding access to Edward Vincent Jr. Park (Centinela Park), a nearby private school and church that may be addressed through a grade separation. The grade of Centinela Avenue affects the

operation of vehicles through the intersection. The DEIS/DEIR contains a design option for a grade separation at Centinela Avenue to address these concerns. Such grade separation may require more extensive construction in the short term and may create some impacts to the palm trees adjacent to the additional railroad right-of-way.



View of Centinela Avenue at Florence Ave/Harbor Subdivision. Traffic movements along with pedestrian flows to a nearby Vincent Park, church and school are major local concerns. The crossing is at the top of a slight incline.

*What is a grade separation? A crossing of a roadway and a railroad at different elevations, such as a bridge structure carrying the highway over the railroad or vice versa. A grade separation can also be created by placing railroad or transit line in an undercrossing or tunnel to separate it from a roadway or another rail line.*

**Specific Effects on Landmark Palm Trees Near Centinela Avenue and Mitigation Options**

One of the most noticeable visual elements along the Harbor Subdivision in the City of Inglewood is the dual row of palm trees. These palms generally mark the southern boundary of Edward Vincent Park. The impact assessment for the both the BRT and LRT Alternatives indicated that the guideway requirements would likely require the removal of some portion of the northern most row of palm trees. It is Metro’s intent to hold focused community urban design and station area meetings in Inglewood to address this issue and design measures to mitigate the visual impact.



Landmark Palms.

### Grade Separation at Manchester

The application of Metro's Grade Crossing Policy to the Crenshaw Corridor Transit Project indicates that at-grade separation is likely necessary for the Manchester Boulevard intersection with the Harbor Subdivision. Because this solution will add capital costs to the project, Metro will explore alternative solutions with the Los Angeles Department of Transportation during the PE phase if the LRT Alternative is selected as the LPA.

**Role of the Aviation / Manchester Station** - Located at the edge of the Westchester district of the City of Los Angeles rather than its center, the proposed Aviation / Manchester has one of the lower potentials for ridership growth among the stations along the proposed transit investment. The immediate area lacks a cohesion as it includes a mix of commercial and industrial uses at the border between the City of Los Angeles and Inglewood. Curves of the alignment and the potential for an elevated crossing make the location of this station right at Manchester difficult. Nonetheless, this location would be the most convenient location for residents of Westchester to access the Crenshaw Transit Corridor. If there is a station at this location, its siting and configuration would need to balance competing modes of access, including pedestrian access from the residential neighborhood immediately to the north, transit access along Manchester and

Florence, and automobile / park-and-ride access from arterials such as Manchester Avenue/Boulevard, Aviation Boulevard, and La Cienega Boulevard.



Grade Crossing at Manchester.

### Connection Between Crenshaw Transit Project and the Los Angeles International Airport

The lack of a convenient connection to LAX from Metro's rail transit system has been under discussion for many years. The nearest rail transit stop to LAX is the Aviation/Imperial Green



Century and Aviation. This location is the gateway to LAX. Metro anticipates that an Automated People Mover system to be constructed operated by the airport will ultimately provide a convenient connection to the airport terminals.

Line station (approximately 1.5 miles from the LAX terminals). The Crenshaw Corridor Transit Project creates the opportunity to bring a transit connection closer to LAX. The DEIS/DEIR proposes either a BRT or LRT station at Century Boulevard and Aviation Boulevard. Metro's coordination with LAX indicates that an "automated people mover" from the terminal area may be planned to connect to this area at some time in the future. The Metro Board, as part of the consideration of the LPA, must consider the certainty and time frame of construction of this important connection.

#### Availability of LRT/BRT Maintenance Yard Sites in Westchester or El Segundo

Both of the BRT and LRT Alternatives require new maintenance yards to service the expanded bus or rail vehicle fleets. Adequate size sites are difficult to find. Two candidate sites are identified in the DEIS/DEIR. One site is located in the Westchester area of Los Angeles along the Harbor Subdivision near Manchester Avenue/Florence Avenue, and the other is located near Rosecrans and Sepulveda Boulevards in the City of El Segundo. Both sites have unique issues that require resolution to make the creation of maintenance facility site viable. The Westchester site would displace an existing Los Angeles County maintenance yard other light industrial uses and a community theater. It also is adjacent to a residential neighborhood. Issues of concern

are whether the County is able to relocate their facility and whether adequate relocation sites can be found for displaced light industrial businesses. For the El Segundo site, the City has expressed concerns that the location of a new maintenance yard would affect planned commercial/retail development sites and street extensions important to the City of El Segundo. Also, the El Segundo site may preclude the reconfiguration of BNSF and Union Pacific railroad storage tracks serving the El Segundo Standard Oil Refinery on the west side of Sepulveda Boulevard.

#### Project Phasing

As discussed in the DEIS/DEIR, transit improvements in the Crenshaw Corridor have been studied and discussed as early as the 1960s. As the process moves forward toward selecting an LPA and the sequencing of funding a new system, the discussion may have to address the phasing of the project. Important consideration will revolve around starting construction at the northern end near the Exposition LRT Line project or at the southern end near the Metro Green Line. Availability of a connection to a maintenance facility will affect this discussion. Additional considerations include the length and the interim termini of any potential phases. Overall, if funding availability affects the timing of construction, the Metro Board will have to consider the community concern over the timing of transit improvements that will take place on the main trunk of Crenshaw Boulevard.



Proposed Maintenance Site D.

*Crenshaw Transit Corridor Project may be constructed in separate phases. If the project is developed in phases, these phases would be decided once the Metro Board recommends an LPA and the project completes more advanced engineering design. Phases are selected as functional operable segments between logical termini.*

### ES.13 Traffic and Parking

The potential construction and operation impacts for both traffic and parking impacts summarized below and further described in Section 3.0 Transportation Impacts.

**Construction Impacts.** Construction of the BRT Alternative would result in traffic impacts at all grade crossings along the Harbor Subdivision right-of-way. Similarly, it is anticipated that construction associated with the LRT Alternative would also result in traffic impacts at all Harbor Subdivision intersections. Under both the LRT and BRT Alternative, construction of at-grade crossings would require intermittent off-peak lane reductions and closures of these crossings for up to six months. It is anticipated that these lane reductions and closures would cause traffic to divert to other locations. Most significantly, would be the disruption of normal business operations as a result of intermittent site access.

Impacts to local traffic and circulation are expected with construction of the BRT and LRT aerial structures. Typical impacts associated with an aerial structure would include temporary and/or long-term lane closure, temporary removal of parking, and secondary impacts, such as increased traffic, to adjacent streets.

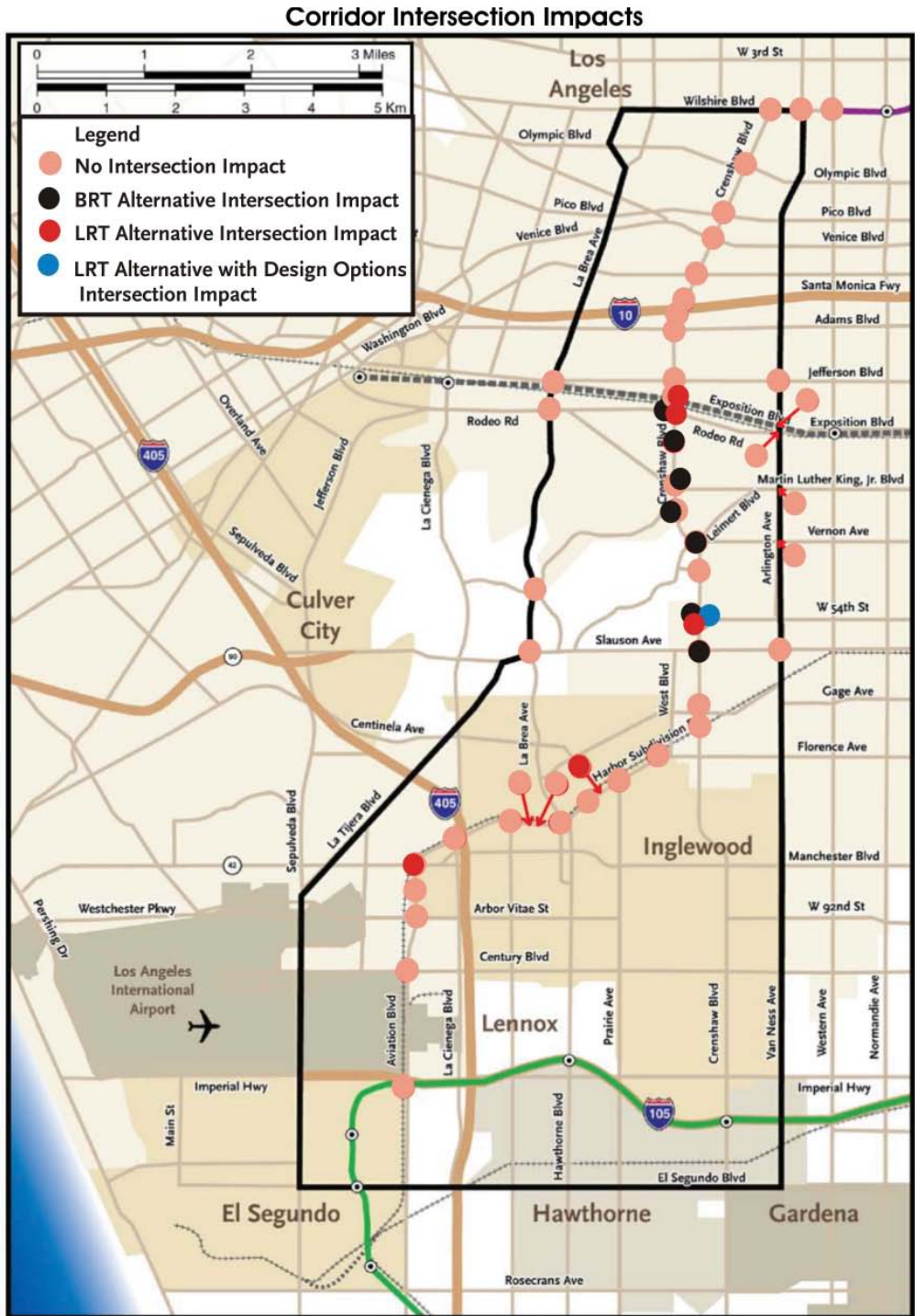
Cut and cover construction associated with the LRT Alternative would prohibit east-west crossings at several designated locations for approximately eight months. These construction period impacts would occur at the station portals, by severely reducing the northbound movements along Crenshaw Boulevard. The number of traffic lanes would be reduced and local circulation would be impacted. Temporary lane closures would occur during off-peak and nighttime periods, potentially requiring temporary street closures during the off-peak periods for up to six months. The median left-turn lanes would likely be closed during the construction period, prohibiting left turns for up to six months. Metro would implement a construction period traffic management plan to deal with anticipated impacts related to congestion and parking. This plan would focus on maintaining traffic flow, providing alternate parking locations, maintaining access to local businesses, and minimizing disruptions to general circulation.

**Operational Impacts.** The BRT Alternative would result in traffic impacts at 7 of the 46 study intersections. These impacts would occur where semi-exclusive, peak-hour bus lanes (allowing non-transit right turns only) occur on Crenshaw Boulevard. The LRT Alternative would result in traffic impacts at 5 of the 46 study intersections. The impacts would occur at intersections where at-grade crossings are present or in station areas where park-and-ride demand increases traffic volumes. The design options for the LRT Alternative would avoid traffic impacts at all but 1 of the 46 study intersections, the remaining impact would occur at an intersection with a proposed at-grade crossing.

Both the BRT Alternative and the LRT Alternative would result in the loss of on-street parking. The BRT Alternative would result in the permanent loss of four on-street spaces on southbound Crenshaw Boulevard between Exposition Boulevard and Rodeo Road. The LRT Alternative would result in the loss permanent loss of 163 northbound and 132 southbound on-street parking spaces between Rodeo Road and Slauson Avenue. Much of this on-street parking loss would occur on the inner portion of the frontage road that borders both sides of Crenshaw Boulevard. The frontage road would be eliminated to accommodate the center-running rail right-of-way.

The project is expected to result in only a minor loss of off-street parking under the BRT and LRT Alternatives. This loss would occur in the Harbor Subdivision portion of the transit corridor and be limited to private off-street lots where the land would be used for station development. These private off-street parking lots would be acquired by Metro prior to construction. While the final number of parking spaces provided at any proposed park and ride lots lot will be determined at a later time, it is assumed that the proposed station parking would provide sufficient capacity to accommodate the anticipated parking demand for LRT or BRT, which is expected to range from approximately 100 to 300 spaces per station. At other stations along the corridor where off-street parking would not be provided, spillover parking to the adjacent streets may occur, but is likely to be minimal based on projected parking demand at stations with park-and-ride facilities.

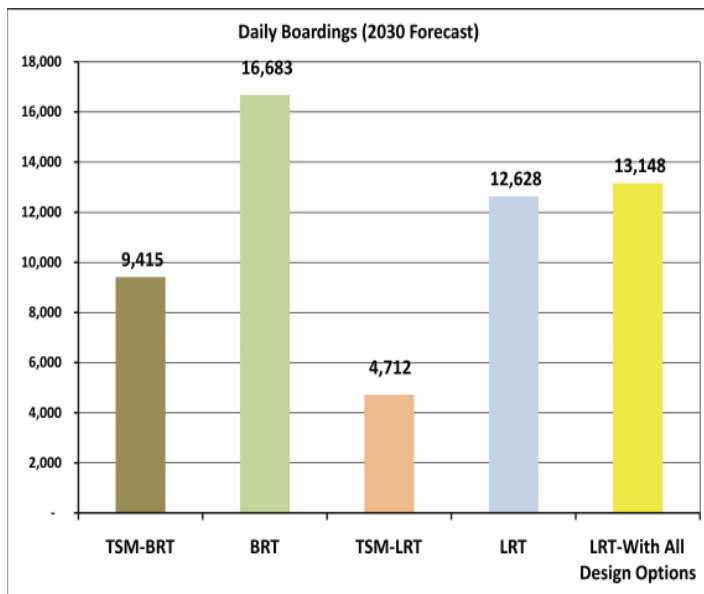




Most of the project operation phase intersection impacts would occur on Crenshaw Boulevard or at grade crossings along the Harbor Subdivision. The BRT Alternative would affect the following seven intersections: Crenshaw/Rodeo, Crenshaw/Coliseum, Crenshaw/King, Crenshaw/Stocker, Crenshaw/Vernon, Crenshaw/54th, and Crenshaw/Slauson. The LRT Alternative would affect the following five intersections: Crenshaw/Exposition, Crenshaw/Rodeo, Crenshaw/54th, Florence/Centinel, and Florence/Manchester. The LRT with design options would only affect the Crenshaw/54th intersection.

**ES.14 Ridership**

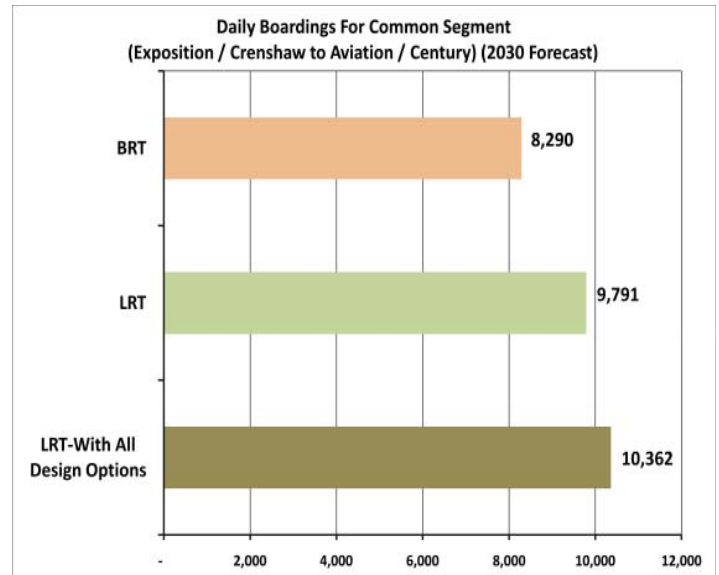
Project ridership in year 2030 for each of the project alternatives is shown below. The TSM Alternative defined in the document provides for improved bus service between LAX and the Green Line and the Metro Purple Line Wilshire/Western Station. This TSM Alternative is also serving as the baseline alternative for the BRT Alternative with a terminus at Wilshire Boulevard (TSM-BRT). Because the LRT alternative terminates at Exposition Boulevard, the TSM Alternative was modified to provide a baseline with a terminus at Exposition Boulevard (TSM-LRT). The TSM Alternative provides modest enhancements to the existing Metro Rapid Bus Service, without the additional features of Bus Rapid Transit. The ridership forecast indicates that the BRT Alternative would increase ridership by 77 percent over its TSM Alternative and the LRT Alternative and LRT Alternatives with design options would increase ridership by 168 and 179 percent from their TSM Alternative, respectively. For purposes of the TSM comparison, ridership information is only provided for the length of the respective service.



The year 2030 travel demand forecast show that the BRT and LRT Alternatives would yield daily ridership ranging from 12,600 to 16,700 riders.

To compare alternatives, ridership for a common segment between Exposition/Crenshaw and Aviation/Century is summarized. For the comparable segment, the LRT Alternatives have higher ridership than the BRT Alternative (18 to 24 percent

greater) Full segment ridership is presented in Section 3 Transportation Impacts.



The LRT Alternative has higher ridership than the BRT Alternative for the common segment.

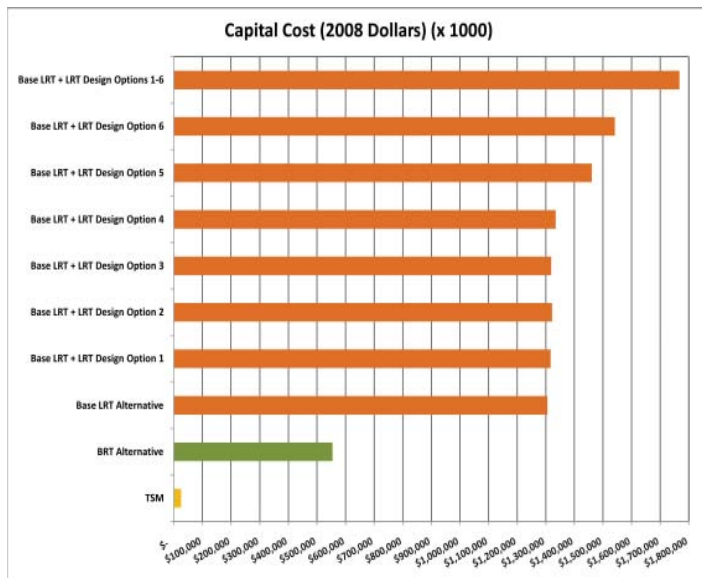
**ES.15 Financial Analysis and Evaluation**

The cost of a transportation investment falls into two categories: capital costs, and operating and maintenance (O&M) costs. Capital costs are the start-up costs for the project, including the costs of guideway construction, vehicles, and any system facilities necessary before the project can begin to operate. O&M costs are the costs associated with the day-to-day running of the new transportation system. Costs, such as labor, vehicle maintenance, and overall facility maintenance fall into this category. This section summarizes both types of costs and presents the proposed capital financing plan, and evaluates Metro’s ability to afford the alternatives under consideration.

**Capital Cost Estimates**

This section summarizes the capital cost estimates for the TSM Alternative, the BRT Alternative, the Base LRT Alternative, and the six LRT Alternative design options. The No-Build Alternative does not have any associated capital costs for comparative

purposes as they are considered in the overall financial capability of Metro along with the other alternatives under consideration. The capital cost methodology and capital cost estimates are found in the Final Capital Cost Report (Parsons Brinckerhoff, March 23, 2009). The TSM Alternative capital cost is estimated at \$25.4 million, the BRT Alternative at \$554 million, and the LRT Alternatives range from \$1.306 billion to \$1.767 billion in 2008 dollars.



Range of Capital Cost. A key consideration is the cost to build the various alternatives under construction. As shown above, the costs range from less than \$100,000 for the TSM Alternative to almost \$1.8 Billion for the LRT Base Alternative inclusive of all six Design Options. The capital cost differential between the BRT Alternative and Base LRT Alternative is approximately \$750,000. The Metro Board will weigh these costs and the benefits of each option as they deliberate on a preferred alternative.

**Operating and Maintenance Cost Estimates**

This section summarizes the O&M cost estimates for the No-Build, TSM, BRT, and Base LRT Alternatives. The O&M costs were estimated using a resource cost build-up model based on the current Metro heavy rail transit (HRT), LRT, BRT, and bus operating costs and the incremental bus costs for the other municipal bus systems in the study area (Santa Monica, Culver City, Los Angeles Department of Transportation (LADOT) Beach Cities Transit, and Torrance). The operating and maintenance cost methodology and cost estimates are found in the *Final Operating and Maintenance Cost Estimate Report* (PB March 26, 2009).

The LRT Alternatives have the greatest change in O&M compared to the No-Build and TSM Alternatives. The LRT Alternatives will cost an additional \$45 million to \$55 million annually to operate and maintain over the No-Build condition. The BRT Alternative will cost an additional \$20 million annually.

**ES.16 Summary of Impacts**

Four alternatives are under consideration for the Crenshaw Transit Corridor Project, a No-Build Alternative, a TSM Alternative, a BRT Alternative, and a LRT Alternative. Six LRT Alternative design options are also under consideration. Each alternative represents a different level of transit service within the Crenshaw Transit Corridor.

Table ES-3 summarizes the physical features of the No-Build and three build alternatives. It also compares the benefits, transportation impacts, environmental consequences and costs of the build alternatives to the No-Build Alternative. Table ES-4 presents the potential impacts and benefits relative to the design options and Table ES-5 presents the same information for the two maintenance and operations facility sites analyzed. The circles are an indication of whether or not a particular alternative or design option would have an adverse or potentially adverse effect. An open circle (○) represent a less than adverse effect, or no adverse effect; a semi-open circle (◐) represents a less than adverse effect with implementation of mitigation measures and a closed circle (●) represents a potentially adverse effect or an adverse effect. Tables ES6 through ES8 provide a more detailed description of the impacts. The information presented in these tables is a summary of the analysis contained in this DEIS/DEIR in Sections 1.0 through 4.0.

*The selection of a Locally Preferred Alternative (LPA) by the Metro Board considers a wide variety of variables including the performance, ridership, costs, benefits, environmental impacts, and public input.*