



Metropolitan
Transportation
Authority

One Gateway Plaza
Los Angeles, CA
90012-2952

SUBJECT: CRENSHAW-PRAIRIE TRANSIT CORRIDOR

**ACTION: RECEIVE MAJOR INVESTMENT STUDY &
DIRECT PREPARATION OF SHORT-TERM
IMPLEMENTATION PLAN**

RECOMMENDATION

- A. Receive and file the Crenshaw-Prairie Corridor Major Investment Study (MIS) as described in Attachment A.
- B. Direct staff to:
 - Prepare ~~as part of the MTA Short Range Transportation Plan~~, a funding and implementation schedule for Crenshaw Metro Rapid enhancements including higher capacity buses, enhanced stations ~~with pedestrian & streetscape improvements~~ and segments of dedicated transit lanes for consideration by the Board, along with other potential projects, as part of the Short Range Transportation Plan;
 - Initiate discussions with the Burlington Northern Santa Fe Railroad Company (BNSF) regarding shared use of the Harbor Subdivision railroad right-of-way within the Crenshaw Corridor for exclusive bus lane or possible future passenger rail uses;
 - Coordinate with the ongoing Los Angeles International Airport (LAX) Master Planning efforts to evaluate connections from any new LAX Intermodal Transit Center to the Crenshaw Corridor;
 - Consider implementing a bus route from the Wilshire/Western Station to the planned LAX Intermodal Transit Center via the Crenshaw Corridor;
 - Continue to reflect potential future implementation of light rail transit (LRT) or a 24-hour Metro Rapid Transitway in the Crenshaw Corridor in the MTA Long Range Transportation Plan.

ISSUE

In March 2001, the Board directed that work proceed on the Crenshaw-Prairie Corridor Major Investment Study (Crenshaw MIS or MIS). This study is now complete and includes a set of technical findings and recommendations.

The Crenshaw MIS builds upon the action taken by the Board in September 2002 to implement a countywide system of Metro Rapid lines serving 24 different routes. One of the routes that was approved for implementation is the Crenshaw Metro Rapid line, which is scheduled to begin service in December 2003. In addition, the Board approved Metro Rapid service on five additional lines serving the Crenshaw corridor. These include Pico Boulevard, La Cienega/Vernon, Florence/Hawthorne, Sepulveda Boulevard and Manchester Avenue.

“Enhanced Metro Rapid Service - The MIS recommends a number of “enhanced Metro Rapid” options that could be implemented as incremental upgrades to the planned Metro Rapid service in the Crenshaw Corridor.

The MIS found that the enhanced Metro Rapid system would provide significant benefits to the Crenshaw Corridor, increasing transit ridership from an estimated 9,400 boardings/day in the year 2020 to more than 37,000 boardings/day, with the enhancements recommended in the MIS. Specific improvements that are recommended as upgrades to basic Metro Rapid service for the Crenshaw Corridor include segments of peak-period dedicated transit lanes (if supported by local jurisdictions), oversized transit vehicles, enhanced station shelters and pedestrian and streetscape improvements located at major transit stations. Additionally, the MIS consultants have recommended an additional bus route linking the Metro Red Line Wilshire/Western Station to the Los Angeles International Airport (LAX)/Metro Green Line/Aviation Station via Crenshaw Boulevard. This service could be provided as a part of the Metro Rapid system or as an airport express service that would be developed in coordination with Los Angeles World Airports.

The costs of the additional enhancements proposed in the MIS above basic Metro Rapid Service are estimated to be approximately \$5.7 million for vehicles and stations, and between \$11-22 million for Crenshaw Boulevard streetscape and pedestrian improvements. More specific funding and schedule information will be included in the Short Range Transportation Plan for consideration by the Board.

Phased Implementation Strategy - The MIS describes a phased-implementation strategy, which allows for the initial implementation of the Metro Rapid lines between 2003-2008, followed by incremental upgrades of the Crenshaw Metro Rapid Line that could be undertaken as additional funding becomes available. The timing of these improvements may also be influenced by other planned projects in the Crenshaw Corridor study area. MTA staff would work with these other parties to identify opportunities for earlier implementation of transit improvements that may present themselves as a result of these ongoing projects. The two biggest planning opportunities in the corridor include the Los Angeles International Airport Master Plan and the Harbor Subdivision railroad right-of-way.

- The LAX Master Plan is proposing a major Intermodal Transit Center adjacent to the Crenshaw Corridor that would provide the opportunity for significant improvements to ground access by transit in the Crenshaw Corridor.
- The Harbor Subdivision railroad right-of-way, which is owned by the MTA, has been used for many years as an exclusive freight rail line. With the opening of the Alameda Corridor in April 2002, the Harbor Subdivision may now be available for shared use with transit, thereby providing an opportunity to increase the speed and ridership of transit in the corridor.

POLICY IMPLICATIONS

The recommended actions are consistent with Board policy as reflected in the MTA's Long Range Transportation Plan to improve the Crenshaw-Prairie Transportation Corridor.

ALTERNATIVES CONSIDERED

The Crenshaw MIS considered a number of higher cost transit alternatives that may be possible in the future when more funding becomes available. These alternatives are currently not anticipated to be possible until after 2010, based on funding forecasts contained in the Long Range Transportation Plan. The recommended actions will achieve significant mobility benefits in a shorter time frame at lower cost.

Alternatives contained in the MIS study, that are not recommended for implementation at this time include:

- **Bus Rapid Transit (Fully Dedicated Facility)**
The Bus Rapid Transit (BRT) alternative included fully dedicated transit lanes on Crenshaw Boulevard, Hawthorne Boulevard and along the Harbor Subdivision railroad right-of-way.
- **Light Rail Transit (LRT)**
The Crenshaw MIS evaluated an LRT alternative operating in a combination of the following five service configurations:
 - At-grade, dedicated median-running operations within corridor streets;
 - At-grade, mixed-flow operations in constrained street locations;
 - Dedicated primarily at-grade operations, with one grade separation at Centinela Avenue, on the BNSF railroad right-of-way;

- Aerial operations to interface with the Metro Green Line near the Aviation Station; and at the existing aerial configuration at Century Boulevard/BNSF railroad right-of-way;
- Below-grade operations on Crenshaw Boulevard between Martin Luther King Jr. Boulevard and Vernon Avenue.

FINANCIAL IMPACT

The recommended action has no impact on the adopted MTA FY03 Budget. If approved by the Board, the recommended Enhanced Metro Rapid Alternative will be included in the Short Range Transportation Plan, and a schedule and funding plan would be developed as a part of that document.

BACKGROUND

The need for transit improvements in the Crenshaw- Prairie Corridor has been documented in two previous transportation studies:

- Crenshaw-Prairie Corridor Preliminary Planning Study, 1994
- Crenshaw-Prairie Corridor Route Refinement Study, December 2000

The MTA Board identified \$346 million in the MTA 2001 Long Range Transportation Plan to implement major capital improvements within the Crenshaw-Prairie Corridor in the year 2019. In March 2001, the MTA Board authorized staff to award a contract to complete the MIS and finalize this phase of the project.

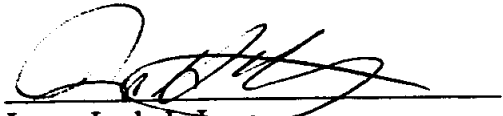
NEXT STEP

In addition to the planned implementation of Metro Rapid service in the Crenshaw Corridor, staff will maintain contacts with BNSF, LAX, LADOT and other jurisdictions regarding implementation of recommended "Enhanced Metro Rapid" upgrades. Staff will prepare an ~~implementation and funding schedule for inclusion in a funding and implementation schedule for Crenshaw Metro Rapid enhancements including higher capacity buses, enhanced stations and segments of dedicated transit lanes, for consideration by the Board, along with other potential projects, as part of the Short Range Transportation Plan.~~

ATTACHMENTS

A. Crenshaw-Prairie Transit Corridor Major Investment Study: Executive Summary

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**CRENSHAW-PRAIRIE CORRIDOR
MAJOR INVESTMENT STUDY**

**Executive Summary
Report**

December 2002

Submitted by:

KORVE/RAW, A Joint Venture

S.0 EXECUTIVE SUMMARY

The Los Angeles County Metropolitan Transportation Authority (LACMTA) has undertaken a Major Investment Study (MIS) for the Crenshaw-Prairie Corridor, a north-south oriented travel corridor that covers portions of four cities – Los Angeles, Inglewood, Hawthorne and El Segundo. The purpose of the Crenshaw-Prairie Corridor MIS process was to conduct a thorough and comprehensive analysis of future transportation system improvements for this constrained and congested Corridor. The results of this MIS planning process are intended to assist decision makers in selecting the most effective solution, or phasing of solutions, to the transportation challenges identified in the Corridor within the context of local goals and objectives.

S.1 Purpose and Need

Over the past 35 years, the need for transportation improvements in the Crenshaw-Prairie Corridor has been established through a series of transportation plans and studies undertaken by the MTA and its predecessor agencies – the Southern California Rapid Transit District (SCRTD) and the Los Angeles County Transportation Commission (LACTC). Starting in 1967, the Crenshaw Corridor was included in the region's first rail system plan. In 1993, a *Preliminary Planning Study* was undertaken by MTA for the Crenshaw-Prairie Corridor that clearly identified the need for Corridor high-capacity transit system improvements. Completed in October 1994, the *Preliminary Planning Study* identified two viable transit service corridors with related modal options to be studied further. In 1996, MTA initiated the next phase of the corridor transportation planning process – a Crenshaw-Prairie Corridor Major Investment Study (MIS). In November 1997, changing MTA priorities called for the reconsideration of future improvements not already under construction, and a decision was made to defer completion of the MIS process and to instead prepare a Route Refinement Study (RRS) that would have a longer shelf life. The *Final Crenshaw-Prairie Corridor Route Refinement Study Report*, completed in December 2000, identified the need for and proposed a set of viable transportation alternatives for the Corridor.

Following the conclusion of the *Crenshaw-Prairie Route Refinement Study*, several new transportation services were implemented and studies completed which changed the planning and operational context of the Study Corridor. First, MTA discontinued consideration of the extension of Metro Red Line service to the vicinity of Venice and San Vicente Boulevards which had provided the northern terminus point for the rail alternatives considered in previous study efforts. Second, Metro Rapid service was successfully implemented on Wilshire and Whittier Boulevards from Santa Monica through Downtown Los Angeles and East Los Angeles to Montebello. Third, a *Mid-City/Westside Transit Corridor Major Investment Study* was completed and recommended the implementation of Bus Rapid Transit (BRT) service on Wilshire Boulevard and Light Rail Transit (LRT) service on the former Exposition Railroad right-of-way – providing new opportunities for interface with existing and future Crenshaw-Prairie Study Area transit services.

The Crenshaw-Prairie Corridor Major Investment Study (MIS) process was reinitiated in May 2001 with the overall objective to develop and assess a full range of transportation alternatives and identify a preferred strategy, or phasing of strategies, which addresses Corridor mobility needs and capacity requirements in the year 2025 and beyond, while being sensitive to community and environmental concerns.

Technical analysis completed in this MIS effort has clearly demonstrated that development of an effective multi-modal transportation network serving the Crenshaw-Prairie Corridor is necessary to meet the future mobility needs of residents and businesses by providing vital intra- and inter-corridor linkages and services. By the year 2025, the magnitude and nature of the Corridor's population, employment and transit dependency growth trends are projected to result in continuing transportation challenges in the

Corridor. All of the analytical efforts conducted for the Crenshaw-Prairie Corridor, including the previous study efforts and this MIS effort, strongly indicate the need for a significant investment for transit system improvements, as supported by the following key facts:

- **The Crenshaw-Prairie Corridor Houses a Major Set of Activity Centers and Destinations.**
As illustrated in Figure S.1, the Crenshaw-Prairie Corridor, covering portions of four cities (Los Angeles, Inglewood, Hawthorne and El Segundo), has a unique combination of regional and local destinations along with a diverse mix of single- and multi-family housing. This dense, mixed-use Study Area is home to a significant number of regional destinations including LAX and two entertainment venues – the Great Western Forum and Hollywood Park. It serves Corridor community civic centers located in Inglewood and Hawthorne, and a large number of shopping districts and centers including Koreatown, the Crenshaw District and Downtown Inglewood. The Corridor also has concentrations of office development along Wilshire Boulevard, in Downtown Inglewood and in El Segundo adjacent to the Metro Green Line.
- **The Corridor Has Weak Connections with the Regional Transportation System.**
The Study Area currently has weak connections to the regional transportation system, and there is no north-south high-capacity transportation connection within the Corridor, nor the western section of the regional transit system. This lack of transit infrastructure limits mobility and transportation choices. The Corridor's only available transit service – bus transit – is constrained in effectiveness and patron convenience by vehicular congestion. The lack of regional transportation system links will become more detrimental to future Corridor travel and economic development as Corridor population and employment continue to grow.

The Crenshaw-Prairie Corridor transportation improvement has the opportunity to play an important role in the regional transportation system by providing a missing service link. Currently, there is no north-south high-capacity connection west of Downtown Los Angeles and the I-110 Freeway – the Metro Blue Line is the only north-south connection in a growing network of east-west rail lines. A rail system connection operating on Crenshaw Boulevard would provide a much-needed second north-south link enhancing regional and Corridor connectivity, and lessening system operational impacts on the capacity at 7th/Metro Center.

- **Existing High Study Area Population and Employment Densities Support Transit.**
The Corridor's land use patterns result in high levels of residential and employment densities that are supportive of transit service. Current population densities within the Crenshaw-Prairie Corridor are approximately four times the average of the County's urbanized area. In the Mid-City subarea, the population density is more than five times the County's average. Reflecting the Corridor population densities, residential densities are also significantly higher than the urbanized area of the County. The Mid-City subarea has the highest residential density with more than five times the dwelling units per acre than the average of the County's urbanized area.

Employment densities within the Crenshaw-Prairie Corridor serve as indicators of the level of economic activity and strength within the Study Area, as well as its potential attractiveness as an employment destination and its future support for a high-capacity transit system. Based on the 2000 Census, the Corridor's employment density is over three times the urbanized Los Angeles County average. The highest employment densities within the Corridor occur in the LAX and Hawthorne subareas with densities ranging from more than five to ten times the County average.

- **The Study Area is forecast to Continue to Capture a Large Share of Regional Population and Employment Growth.**
By 2025, Crenshaw-Prairie Corridor population density was projected to increase by 47 percent – approximately eight times the growth forecast for the County's urbanized area. The Mid-City

subarea was forecast to continue to be the densest portion of the Corridor with a population density of more than eleven times the urbanized County's density. Reflecting the forecast population change, the residential density was forecast to increase by 52 percent by year 2025. The Mid-City will continue to have a residential density more than ten times the urbanized County average.

Employment within the Corridor is expected to increase with a forecast 21 percent growth in jobs by the year 2025. All of the subareas, excluding LAX, will share in the job growth, with the Inglewood subarea forecast to have the most significant job growth with an increase in the current number of jobs by 86 percent. Corresponding to the Corridor's projected employment growth, the future employee density was forecast to be more than six times the estimated average density for the County's urbanized area. The highest and most significant employment density increase was forecast to occur in the Inglewood subarea. These future job projections do not reflect any LAX Master Plan revisions as these recommendations are currently being revised.

- **There is a Significant Transit Dependent Population in the Study Area.**
More than 49 percent of all Corridor households are designated as low income, with 56 percent identified as low income in the Crenshaw subarea. A Corridor-wide average of 16 percent of all households does not have access to an automobile, compared to eight percent in the County's urbanized area, with 19 percent having no auto access in the Crenshaw subarea. Forecasts show a growing transit-dependent population with a projected 55 percent increase in Corridor residents reliant on the Study Area's transit system.
- **There is a High Level of Transit Usage in the Study Area.**
The identified demographic indicators contribute to higher than average transit usage in the Crenshaw-Prairie Corridor. Currently, the County's urbanized area transit mode split is eight percent compared to 16 percent in the northern half of the Corridor and 11 percent in the southern portion. By the year 2015, estimates project a transit mode split increase to 27 percent in the northern portion of the Corridor – more than double the expected increase in the County's urbanized area to 11 percent. The transit mode split in the southern portion of the Corridor is forecast to increase to 16 percent – more than 50 percent higher than the countywide average.
- **The Current Corridor Transit System is Operating At-Capacity and with Slowing Speeds.**
Due to the Corridor's higher than average transit ridership – approximately double the mode split of the County's urbanized area. There is a high demand for and usage of the existing bus services. Also, bus service in the Crenshaw Corridor currently operates at 12.5 mph; MTA projections show an average system-wide bus operational speed of 10 mph in the year 2015.
- **There is a Demonstrated Need for Increased Corridor Transportation System Capacity.**
The MIS identified an increasing number of future trips with a forecast of more than 350,000 additional daily trips that will occur in the Corridor in the year 2015. Currently, 78 percent of the Corridor's freeway system operates at or below Level of Service (LOS) F during the morning peak period, with 92 percent of the system operating at or below LOS F in the evening peak period. During both peak periods, current travel demand exceeds the Corridor's arterial system capacity resulting in significant congestion and delay. Bus service in the Corridor is operating at- or over-capacity, and future projections show a significant increase in transit demand (55 percent) by the year 2015. The Corridor's congested freeway and arterial street system, as well as the heavily-utilized bus system, offer no additional capacity to accommodate the projected 19 percent increase in daily trips.

- **Corridor Residents Have Limited Travel Options.**
The ability to move quickly and efficiently in the Crenshaw-Prairie Corridor can also be expressed in terms of transportation system choice. Currently, Corridor travelers have a limited choice in travel options – auto or bus transit – circulating on the same congested street system. Existing traffic makes bus service slow and makes utilization undesirable to non-transit dependent residents. A multi-modal Corridor strategy or speed improvements to bus transit service would provide all local residents with more travel options.

- **The Region and the Corridor Have Continuing Air Quality Concerns**
The Corridor is located within the South Coast Air Basin – the airshed with the worst air quality in the nation. Mobile source emissions from vehicles are the single largest contributor to air quality problems in the basin. There is a demonstrated need to increase Crenshaw-Prairie Corridor transportation capacity to serve the forecast trip growth without increasing mobile source ozone emissions in this nonattainment area. Annual regional vehicle miles traveled (VMT) would decrease with implementation of both the BRT and LRT alternatives.

S.2 Alternatives Considered

During the first phase of the MIS process, an initial set of transportation alternatives was identified based on past study efforts and in consultation with the public, stakeholders, elected officials and city staff members. This set of options was screened through an evaluation and public outreach process to identify a Final Set of Alternatives of the most viable options to meet the identified goals and objectives for transportation improvements in the Study Corridor, which included the following five local goals identified by the Crenshaw-Prairie community:

1. Improve mobility within the Corridor.
2. Improve regional connections to and from the Corridor.
3. Meet the transportation needs of Corridor residents.
4. Act as a catalyst for economic development in the Corridor.
5. Stimulate revitalization of neighborhoods around station sites.

Based on the results of an extensive public and stakeholder outreach process and a fatal flaw level of technical and environmental analysis, a Final Set of Alternatives was identified for further conceptual level technical and environmental analysis. The Final Set of Alternatives for the Crenshaw-Prairie Corridor consisted of the No Build, Metro Rapid and two build alternatives – Bus Rapid Transit and Light Rail Transit.

No Build Alternative

The Corridor's No Build Alternative represented existing transit services, plus commitments outside of the Study Area as defined in MTA's adopted *2001 Long Range Transportation Plan*. The "no action" alternative was used as a baseline for assessing the effectiveness of the improvements proposed by each alternative. The transit network represented in the No Build Option included the existing alignments and operating schedules of the Metro Red, Blue and Green Lines, as well as the planned rail lines serving Pasadena, the Eastside, and the first phase of the Exposition LRT Line. Future year 2025 bus service was upgraded to represent a larger Countywide fleet size along with expansion of the Metro Rapid system.

Metro Rapid Alternative

The Metro Rapid Alternative evaluated added future transit improvements serving the Study Corridor as identified in MTA's adopted *2001 Long Range Transportation Plan*, the *Metro Rapid Five-Year Implementation Plan* (adopted by the MTA Board in September 2002), and this Study's initial screening process. This option included a grid of north-south and east-west Metro Rapid routes, and expanded

local circulator service. As presented in Figure S.2, Metro Rapid service was evaluated on the following Study Corridor service alignments:

1. ***Crenshaw/Rossmore/Metro Green Line*** – Operating south from the Metro Red Line Hollywood/Vine Station along Vine Street and then Rossmore Avenue to Wilshire Boulevard, south on Crenshaw Boulevard through Koreatown and the Crenshaw District to terminate at the Metro Green Line Crenshaw Station. This proposed service alignment would extend south beyond the Study Area boundaries to the South Bay Galleria.
2. ***Crenshaw/Wilshire-Western/Metro Green Line*** – Operating west from the Metro Red Line Wilshire/Western Station along Wilshire Boulevard, then south on Crenshaw Boulevard through Koreatown and the Crenshaw District where it would turn west on Florence Avenue through Downtown Inglewood and then south along Aviation Boulevard to interface with the proposed LAX Intermodal Transportation Center, and terminating at the Metro Green Line Aviation Station.
3. ***Florence/Hawthorne*** – Operating west on Florence Avenue from Downtown Los Angeles, turning south on La Brea Avenue in Downtown Inglewood, continuing on La Brea Avenue as it becomes Hawthorne Boulevard to interface with the Metro Green Line Hawthorne Station, and then terminate at El Segundo Boulevard in Downtown Hawthorne. This proposed service alignment would extend south beyond the Study Area boundaries to the South Bay Galleria.
4. ***Century*** – Operating west on Century Boulevard from southern Downtown Los Angeles to terminate at the proposed LAX Intermodal Transportation Center.
5. ***Vernon/La Cienega*** – Operating west on Vernon Avenue from southern Downtown Los Angeles, north on Crenshaw Boulevard to serve the Crenshaw District, west on Stocker Street and then north on La Cienega Boulevard.
6. ***Pico*** – Operating west on Pico Boulevard from Downtown Los Angeles to the Pico-Rimpau Transit Center located in the Mid-City area, and then continuing west on Pico Boulevard to West Los Angeles and Santa Monica.
7. ***Venice*** – Operating east on Venice Boulevard from Santa Monica and West Los Angeles to its termination at the Pico-Rimpau Transit Center located in the Mid-City area. Passengers wishing to travel further east to Downtown Los Angeles would transfer to the Pico Metro Rapid Line.

It should be noted that the MTA Board adopted a majority of the Metro Rapid lines discussed above and evaluated in this MIS effort in September 2002 as part of the *Metro Rapid Five-Year Implementation Plan* with the following changes:

- The Florence/Hawthorne Metro Rapid Line was broken into two implementation phases with Florence Avenue service falling within Phase IIA and Hawthorne Boulevard operations being initiated in Phase IIB.
- Venice Boulevard Metro Rapid service was deleted from consideration during the next five-year timeframe; service would continue to be provided by existing local and limited stop bus service.
- The adopted MTA Plan included Metro Rapid service on Manchester Boulevard, rather than along Century Boulevard, based on the existing heavy bus ridership along with the high number of destinations located along this service alignment.

Metro Rapid Alternative



Crenshaw-Prairie Transportation Corridor
Major Investment Study

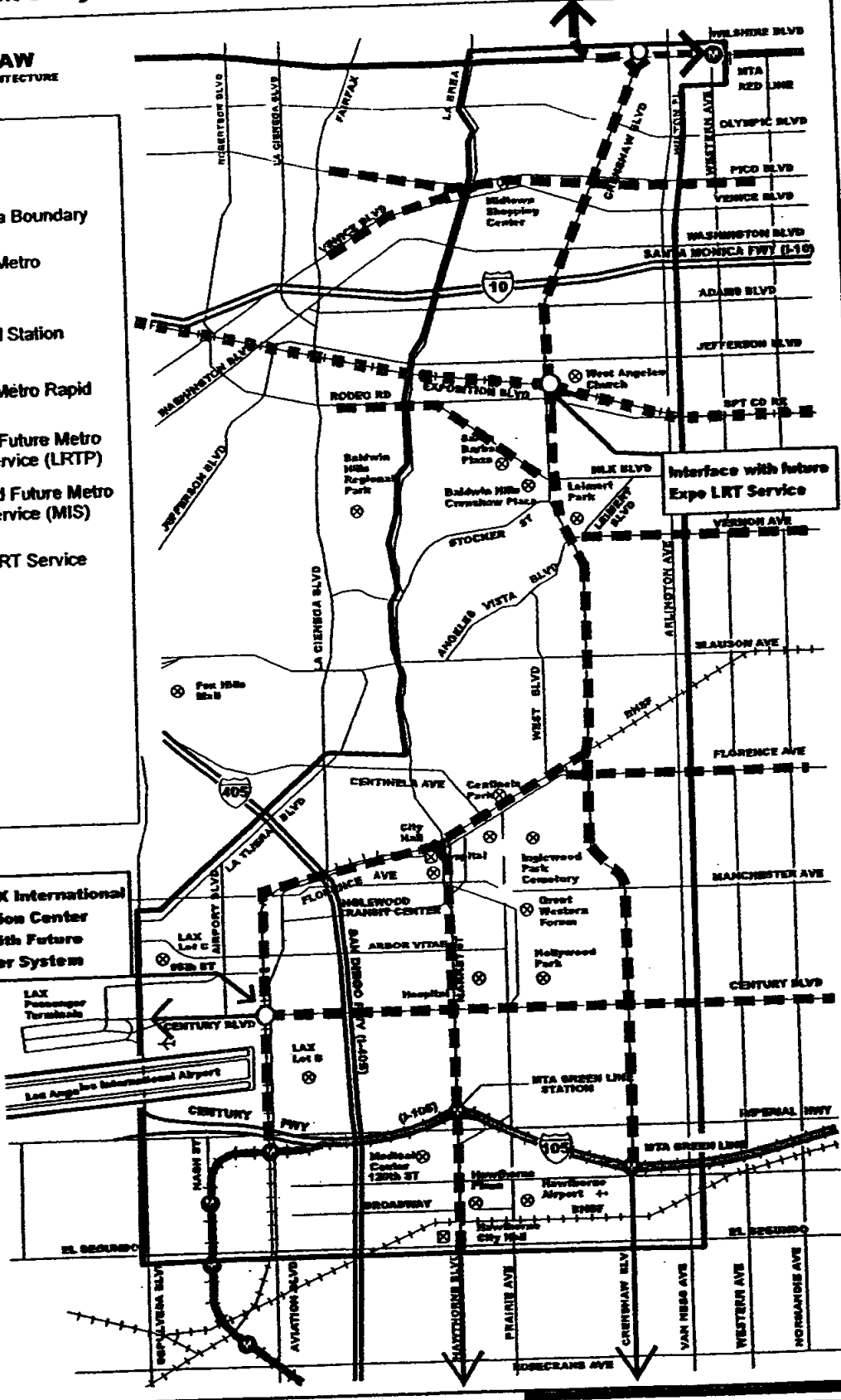


LEGEND

- Study Area Boundary
- Regional Metro Rail Line
- Metro Rail Station
- Existing Metro Rapid Service
- Planned Future Metro Rapid Service (LRTP)
- Proposed Future Metro Rapid Service (MIS)
- Future LRT Service

Possible LAX International Transportation Center Interface With Future People Mover System

Interface with future Expo LRT Service



Two future Metro Rapid lines studied in the Crenshaw-Prairie MIS were not included in the adopted *Metro Rapid Five-Year Implementation Plan*. Additional funding would need to be identified for the following two Corridor Metro Rapid lines not included in the adopted Metro Rapid Program:

- ***Crenshaw/Wilshire-Western/Metro Green Line*** – Designed to provide Corridor residents and regional travelers with no transfer service from the Metro Red Line Wilshire/Western Station through the Crenshaw District to LAX.
- ***Century*** – Planned to provide Corridor residents with direct access to employment destinations in the LAX area, and regional travelers with a direct connection to the proposed LAX Intermodal Center.

For the proposed local circulator service, two lines serving the Study Area, in addition to the Crenshaw DASH lines, were included in the Metro Rapid Alternative. The circulator lines were assumed at this level of analysis to serve: 1) the northern portion of the Corridor, and 2) the City of Inglewood. The exact routing will be determined with community input during any follow-on preliminary engineering phase.

Bus Rapid Transit Alternative

Bus Rapid Transit (BRT) was defined as bus service providing the full range of physical and operational attributes of Metro Rapid service with the addition of dedicated lane operations. This alternative would be operated by MTA under the service name of "Metro Rapid." As presented in Figure S.3, BRT service was evaluated on the following Study Corridor service alignments:

1. ***Crenshaw/LAX/Metro Green Line*** – Operating south from Wilshire Boulevard Metro Rapid service on Crenshaw Boulevard through Koreatown and the Crenshaw District to the former BNSF Railroad right-of-way, along the right-of-way through Downtown Inglewood, then south to interface with the proposed LAX Intermodal Transportation Center, and terminating at the Metro Green Line Aviation Station.
2. ***Crenshaw/Hawthorne*** – Operating south from Wilshire Boulevard Metro Rapid service on Crenshaw Boulevard through Koreatown and the Crenshaw District to the former BNSF Railroad right-of-way, along the right-of-way to La Brea Avenue and south on La Brea Avenue through Downtown Inglewood, continuing south as La Brea Avenue becomes Hawthorne Boulevard, providing a transfer to the Metro Green Line at the Hawthorne Station, and terminating at El Segundo Boulevard in Downtown Hawthorne. This proposed service alignment would extend south beyond the Study Area boundaries to the South Bay Galleria.

The Corridor BRT Alternative was evaluated as operating in three service configurations:

- ***Mixed-flow operations*** in constrained street locations;
- ***Street dedicated lane operations*** – peak period-only or 24-hour curbside dedicated lane operations where possible (median operations may be possible on Hawthorne Boulevard within the City of Hawthorne); and
- ***Railroad right-of-way dedicated lane operations*** on the former Burlington Northern-Santa Fe (BNSF) Railroad right-of-way now owned by the MTA.

Figure S.3

Bus Rapid Transit Alternative

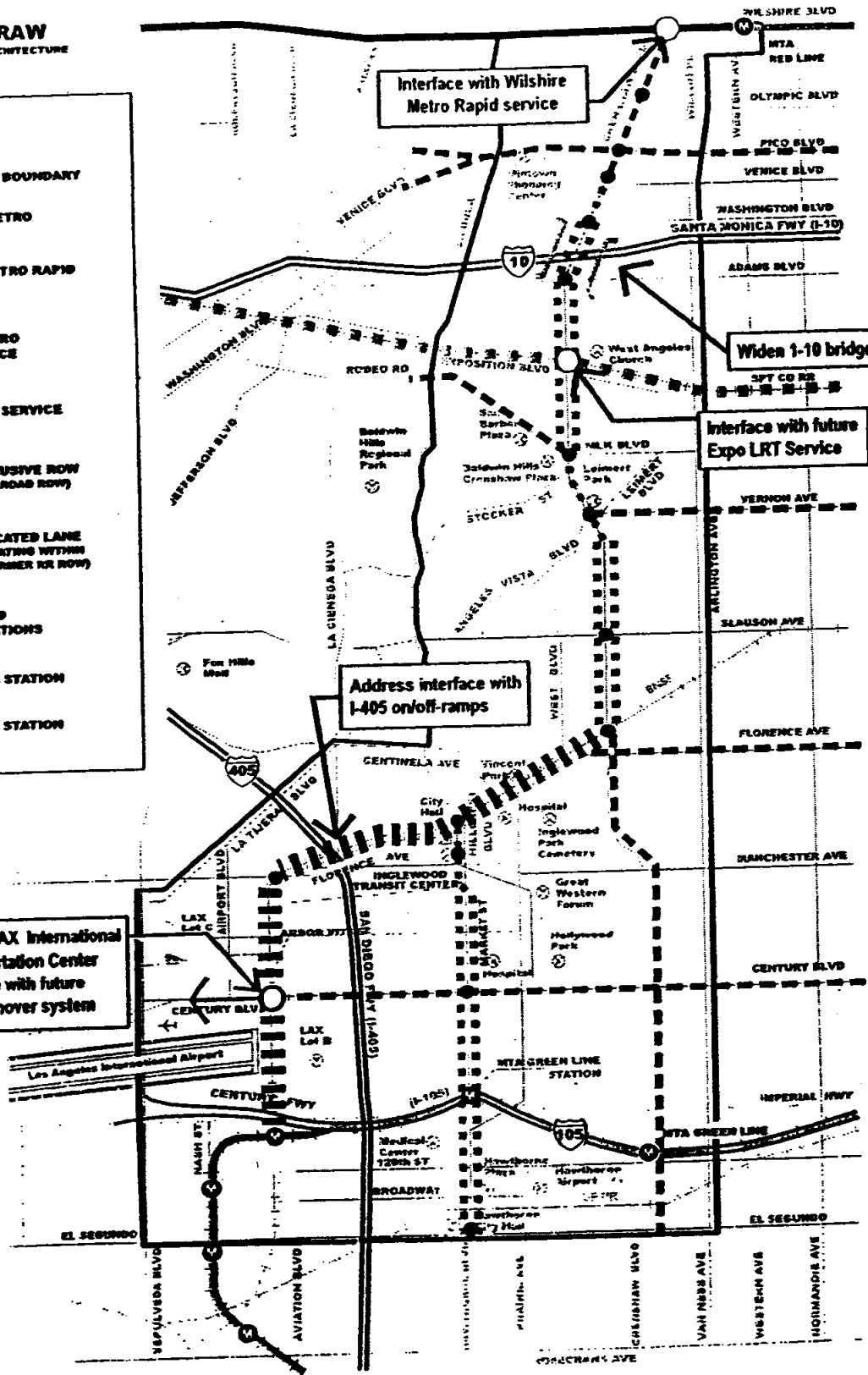


Crenshaw-Prairie Transportation Corridor
Major Investment Study



LEGEND

- STUDY AREA BOUNDARY
- REGIONAL METRO RAIL LINE
- EXISTING METRO RAPID SERVICE
- FUTURE METRO RAPID SERVICE
- FUTURE LRT SERVICE
- BRT IN EXCLUSIVE ROW (FORMER RAILROAD ROW)
- BRT IN DEDICATED LANE (OPTION OPERATING WITHIN STREET OR FORMER RR ROW)
- BRT IN MIXED FLOW OPERATIONS
- BRT SYSTEM STATION
- METRO RAIL STATION



BRT service would operate in mixed-flow conditions with other vehicular traffic in the following sections of the Study Corridor:

- **Crenshaw Boulevard** – In the Northern and Mid-City sections between Wilshire and Washington Boulevards, and in the Crenshaw District between Martin Luther King, Jr. Boulevard and Vernon Avenue.
- **La Brea Avenue** – In Downtown Inglewood between the former BNSF Railroad right-of-way and Manchester Avenue.

A future decision to be made is whether the BRT dedicated lanes would operate only during peak periods or on a 24-hour basis. Peak period-only dedicated lane operations could be considered Phase I option with expansion to a longer timeframe with more analysis. This decision would be made based on more detailed analysis and working closely with the impacted city transportation departments – Los Angeles, Inglewood and Hawthorne, and possibly the County of Los Angeles. There would be no BRT impacts in the City of El Segundo.

Utilization of the former railroad right-of-way offers a unique opportunity for BRT service in the Crenshaw-Prairie Corridor by allowing 46 percent of the proposed Crenshaw/Metro Green Line Alignment Alternative to operate in a dedicated right-of-way minimizing traffic and parking impacts, while providing higher travel speeds for BRT patrons. Approximately 14 percent of the Crenshaw/Hawthorne Alignment Alternative would operate on the former railroad right-of-way.

Light Rail Transit (LRT) Alternative

Light Rail Transit (LRT) service, similar to the service currently operating on the Metro Blue and Green Lines, and under construction for the Pasadena and Eastside Gold Line, was studied for the Crenshaw-Prairie Corridor. As presented in Figure S.4, LRT service was evaluated on the following Study Corridor service alignments:

1. **Crenshaw/LAX/Metro Green Line** – Operating south from the future Exposition Light Rail Line in the median of Crenshaw Boulevard through the Crenshaw District to the former BNSF Railroad right-of-way, along the right-of-way through Downtown Inglewood, and then south to interface with the proposed LAX Intermodal Transportation Center and on to a direct service connection with the Metro Green Line at the Aviation Station.
2. **Crenshaw/Prairie/Hawthorne** – Operating south from the future Exposition Light Rail Line in the median of Crenshaw Boulevard through the Crenshaw District to the former BNSF Railroad right-of-way, along the right-of-way to Prairie Avenue and then south in the median of Prairie Avenue through Inglewood (past Daniel Freeman Hospital, the Forum and Hollywood Park) to approximately 111th Street and then west along the northside of the I-105 Freeway to accommodate a transfer to the Metro Green Line Hawthorne Station, south in the median of Hawthorne Boulevard and terminating at El Segundo Boulevard in Downtown Hawthorne.

During Initial Screening, extension of LRT service, either at-grade or in a subway configuration, north from the future Exposition LRT Line to Wilshire Boulevard connecting with a future Metro Red Line Wilshire/Crenshaw Station, was evaluated and removed from further consideration at this time due to significant environmental and operational impacts, which may be addressable in the future. In summary:

- **At-grade LRT operations** were precluded due to the severely constrained right-of-way width between Wilshire and Washington Boulevards which allows for only two travel lanes in each direction. While this is the same area where mixed-flow operations were proposed for the BRT

Figure S.4

Light Rail Transit Alternative



Crenshaw-Prairie Transportation Corridor
Major Investment Study

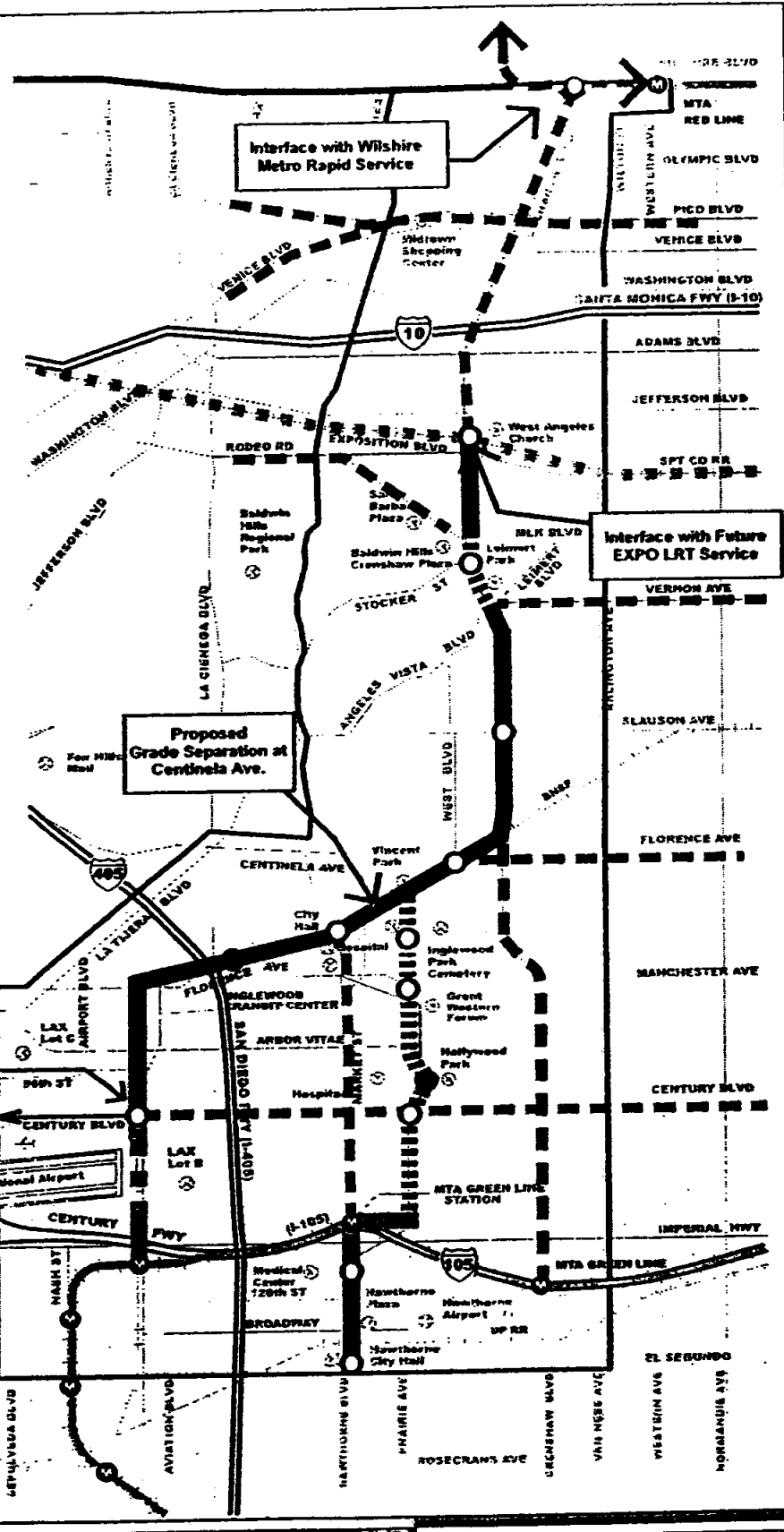


LEGEND

- STUDY AREA BOUNDARY
- REGIONAL METRO RAIL LINE
- METRO RAIL STATION
- FUTURE METRO RAPID SERVICE
- EXISTING METRO RAPID SERVICE
- FUTURE LRT SERVICE
- LRT AT-GRADE SERVICE
- LRT AT-GRADE SERVICE-MIXED FLOW OPERATIONS
- LRT TRENCH SERVICE
- LRT GRADE-SEPARATED SERVICE
- LRT SYSTEM STATION
- SPECIAL EVENT-ONLY LRT STATION
- FUTURE LRT STATION

Possible LAX International Transportation Center Interface With Future People Mover System

LAX Lot C
LAX Passenger Terminal
Los Angeles International Airport



Alternative, there would be a greater resulting impact with LRT operations requiring an at-grade station along with tail or cross-over tracks to facilitate operations.

- **Subway LRT operations** were removed from consideration at this time due to concentrated subsurface hydrogen sulfite which precluded extension of the Metro Red Line south on Crenshaw Boulevard in the past. This issue may be resolvable in the future, but the technology currently does not exist to mitigate this major constraint.

Analysis was performed to evaluate ridership benefits and cost impacts of the future extension of Crenshaw LRT service north to Wilshire Boulevard. In addition, other future regional decisions would have an impact of the performance of the Crenshaw LRT Line. A conceptual analysis was performed considering extension of the Metro Red Line to a future Wilshire/Crenshaw Station, and extension of the Exposition LRT Line from its interim terminus within Culver City to its proposed western terminus within Santa Monica.

The Crenshaw-Prairie Corridor MIS effort evaluated an LRT alternative operating in a combination of the following five service configurations:

- **Dedicated median-running operations** within Corridor streets;
- **Mixed-flow operations** in constrained street locations;
- **Railroad right-of-way dedicated lane operations** on the former Burlington Northern-Santa Fe (BNSF) Railroad right-of-way now owned by the MTA in a primarily at-grade configuration with one grade separation proposed at Centinela Avenue;
- **Aerial operations** to interface with the Metro Green Line at the Aviation Station and the existing bridge crossing located at Century Boulevard/BNSF Railroad right-of-way;
- **Trench operations** along the railroad right-of-way at the end of the LAX runways approximately between 104th and 111th Streets.

LRT service would operate in mixed-flow conditions with other vehicular traffic in the following sections of the Study Corridor:

- **Crenshaw Boulevard** – In the Crenshaw District between Martin Luther King, Jr. Boulevard and Vernon Avenue; and
- **Prairie Avenue** – In Inglewood between the former BNSF Railroad right-of-way and 111th Street.

Utilization of the former railroad right-of-way offers a unique opportunity for LRT service in the Crenshaw-Prairie Corridor by allowing 63 percent of the proposed Crenshaw/Metro Green Line Alignment Alternative to operate in a dedicated right-of-way minimizing traffic and parking impacts, while providing higher travel speeds for LRT patrons. Approximately 17 percent of the Crenshaw/Hawthorne Alignment Alternative would operate on the former railroad right-of-way.

S.3 Evaluation Summary

The Final Set of Alternatives was evaluated through a conceptual technical and environmental setting analytical effort. This analysis was intended to provide the public and decision-makers with technical information to select the most viable transportation strategy, or phasing of strategies, which would

address Corridor mobility needs and capacity requirements in the year 2025 and beyond, while being sensitive to community, environmental and economic development concerns. A conceptual level of analysis identified a range of technical information for each of the MIS alternatives which is summarized below in Table S.1.

Table S.1: Summary of Technical Results

Alternative	Length (Miles)	Number of Stations	Daily Total Corridor Boardings	Daily New Riders Over No Build	Daily New Riders Over Metro Raid	Capital Cost (Millions)
Metro Rapid	28.2	TBD	37,000	13,400	--	\$17-28
BRT	13.5	19	46,900*	17,800	4,400	\$336-410
LRT	11.4	15	43,400*	21,800	8,400	\$775

*Corridor Boardings include the BRT or LRT line plus any continuous north-south Metro Rapid Service on Crenshaw Blvd and Hawthorne Blvd.

For the BRT Alternative, a range of conceptual level capital costs was identified for two project elements:

1. **Widening of the bridge over the I-10 Freeway to accommodate dedicated lane operations** – The on- and off-ramps at the current Crenshaw Boulevard crossing of the I-10 Freeway have been identified as possibly substandard and may require reengineering with associated property acquisition. The lower end of the range (\$2.9 million) identifies the cost to reconstruct the bridge to accommodate two additional travel lanes for dedicated BRT operations. The higher end of the range (\$40 million) begins to quantify the cost of a more extensive reconstruction of the ramps, along with possible associated property acquisition, and may be conservative.
2. **Conversion of the former BNSF Railroad right-of-way for bus operations** – The identified range of conceptual costs reflects three railroad right-of-way reuse options:
 - Freight rail operations removed permanently with conversion of the right-of-way solely to BRT operations;
 - Freight rail operations remain with BRT service operated through a temporal (time of day) separation agreement (e.g., BRT service would run 6:00 AM – 9:00 PM with freight rail operations between 9:01 PM – 5:59 AM); and
 - Freight rail operations retain full utilization of the right-of-way with BRT service operations occurring on adjacent Florence Avenue and Aviation Boulevard.

During any subsequent preliminary engineering efforts, system components and requirements would become more detailed in consultation with Caltrans, impacted jurisdictions and the BNSF Railroad as appropriate. Revised cost assessments would be prepared accordingly, and described in any subsequent future Environmental Impact Report/Environmental Impact Statement (EIR/EIS) efforts.

The above summary of technical results presents information about the alternatives on a system basis – that is each alternative represents two service branches forming a single system, but the decision may be made to implement only one service alignment of one or both of the alternatives. In summary, the BRT and LRT alternatives could be divided into the following two service branches:

- **Crenshaw/LAX/Metro Green Line** – Operating from Wilshire Boulevard (BRT) or the future Exposition LRT Line (LRT) south along Crenshaw Boulevard through Koreatown and the Crenshaw District to the former BNSF Railroad right-of-way, along the right-of-way through Downtown Inglewood, and then south to interface with the proposed LAX Intermodal Transportation Center and the Metro Green Line Aviation Station.
- **Crenshaw/Hawthorne** – Operating from Wilshire Boulevard (BRT) or the Exposition LRT Line (LRT) south along Crenshaw Boulevard to the former BNSF Railroad right-of-way. The BRT Alternative would then operate along the right-of-way to La Brea Avenue where it would turn south to run south along La Brea Avenue and then Hawthorne Boulevard. The LRT Alternative would operate along the right-of-way to Prairie Avenue where it would turn south to run in the median of Prairie Avenue, turning west to connect with the Metro Green Line Hawthorne Station and then turn south to operate in the median of Hawthorne Boulevard.

Under the BRT Alternative, either branch could be implemented as a first phase. Given the outstanding issue of freight rail operations on the BNSF Railroad right-of-way that may preclude BRT operations on an interim basis, a decision could be made to implement the Crenshaw/Hawthorne Branch first providing immediate BRT service south from Wilshire Boulevard to Koreatown, the Crenshaw District, Downtown Inglewood and Hawthorne, with connections with the Red Line in the north and the Green Line in the south. For the LRT Option, a decision could be made to proceed first with the Crenshaw/LAX/Metro Green Line Branch, while deferring implementation of the Crenshaw/Prairie/Hawthorne Branch. If the Crenshaw LRT Line is operated as a northern extension of the Metro Green Line, the Crenshaw/Metro Green Line Branch would provide a direct Green Line service connection from an existing system component (Y-connector) that was constructed to allow for the future northern extension of the Green Line.

In addition, an interim BRT System Alternative has been identified and conceptual capital cost developed. This alternative calls for BRT dedicated lane service during peak periods only with signage and striping improvements only made – no curb lane gutter and pavement improvements would be made. If this lower cost option appears viable, expansion to a 24-hour basis with pavement improvements could be made at a future time. This decision would be made based on more detailed analysis and working closely with the impacted city transportation departments – Los Angeles, Inglewood and Hawthorne, and possibly the County of Los Angeles. There would be no BRT impacts in the City of El Segundo.

Table S.2 below presents an overview of conceptual capital costs and related technical information for each service option of the BRT and LRT alternatives.

Table S.2: Detailed Summary of Technical Results

Alternative	Length (Miles)	Number of Stations	Daily Corridor Boardings	Capital Cost (Millions)	Notes
BRT System					
• Interim BRT System	11.0	16	--	\$1-7	Peak period-only dedicated lane operations
• Crenshaw/LAX/Metro Green Line Alignment	10.2	15	31,815	\$253-327	Without La Brea/ Hawthorne BRT service
• Crenshaw/Hawthorne Alignment	11.0	16	29,850	\$248-300	Without railroad right-of- way to LAX service
LRT System					
• Crenshaw/LAX/Metro Green Line Alignment	7.0	8	38,455	\$476	Without Prairie/ Hawthorne LRT service
• Crenshaw/Prairie/ Hawthorne Alignment	8.5	12	24,045	\$578	Without railroad right-of- way to LAX service

Table S.3 presents an overview of the environmental and community impacts that would be expected with the implementation of each of the alternatives under study. The possible impacts fall primarily in the following categories:

Table S.3: Summary of Environmental and Community Impacts

Option	Environmental and Community Impacts	Traffic and Parking Impacts
Metro Rapid	<ul style="list-style-type: none"> • Noise and air pollution from increased bus service 	<ul style="list-style-type: none"> • Minor impacts on functioning of arterial system from increased bus service • Impacts to right turn movements • Some increased delay and congestion due to additional signal green time for buses • Possible impacts between increased number of transit vehicles and pedestrians/bicyclists
BRT	<ul style="list-style-type: none"> • Construction impacts: short-term traffic disruptions, noise and air pollution • Potential impacts to historically or culturally significant resources within the Crenshaw District • Noise and vibration from increased bus service • Potential air pollution “hot spots” at certain intersections • Limited acquisitions of property for dedicated bus lane space 	<ul style="list-style-type: none"> • Loss of travel lane in each direction between Crenshaw/Washington and Crenshaw/MLK, Crenshaw/Vernon and Crenshaw/Railroad right-of-way • Loss of travel lane in each direction on La Brea/Hawthorne between Manchester and I-105 Freeway • Loss of median in Hawthorne Boulevard or travel lane between I-105 Freeway and El Segundo Boulevard • Minor loss of peak period on-street parking on one or both sides at locations along Crenshaw Boulevard (20% of street) • Significant loss of peak period on-street parking on one or both sides at locations along La Brea/Hawthorne (76% of street) • Possible impacts between increased number of transit vehicles and pedestrians/bicyclists
LRT	<ul style="list-style-type: none"> • Construction impacts: short-term traffic disruptions, noise and air pollution • Potential impacts to historically or culturally significant resources within the Crenshaw District • Noise and vibration from train service • Potential air pollution “hot spots” at certain intersections • Limited acquisitions of property for required rail right-of-way space 	<ul style="list-style-type: none"> • Loss of travel lane in each direction between Crenshaw/Exposition and Crenshaw/MLK, Crenshaw/Vernon and Crenshaw/Railroad right-of-way • Loss of a travel lane in one direction on Prairie Avenue • Loss of median on Hawthorne Boulevard between I-105 Freeway and El Segundo Boulevard • Permanent loss of on-street parking on one or both sides at locations along Crenshaw (50%) • Permanent loss of on-street parking on one side at locations along Prairie Avenue (43%) • Possible impacts between increased number of transit vehicles and pedestrians/bicyclists • Need to prevent pedestrian crossing of LRT tracks except at designated, protected locations

Public meetings were held throughout the Study Corridor from July through October 2001. Feedback was received through public comment at these meetings, personal contacts with individual stakeholders, calls to the hot line, completion of surveys and letters written by stakeholder groups. Table S.4 provides a summary of the public comments received regarding the transit alternatives presented to the public during initial screening and final outreach.

Table S.4: Summary of Public Comments During Public Outreach

Option	Public Comments
Metro Rapid	<p><i>Initial Screening:</i></p> <ul style="list-style-type: none"> • Implementation of Metro Rapid service was positively received by the Corridor communities. • Many community members made supportive comments about the existing Metro Rapid service, and were in favor of seeing this system expanded within the Study Corridor. • This alternative consistently ranked very high in the surveys and received many first place rankings from participants. Overall it was ranked second among the modal options presented.
BRT	<p><i>Initial Screening:</i></p> <ul style="list-style-type: none"> • The BRT Alternative was the most difficult for people to understand due to a lack of personal experience with this type of system. • This alternative consistently ranked third behind the LRT and Metro Rapid options. • Concerns with the BRT option included: impacts to traffic capacity and loss of curbside parking, potential property takes, construction impacts, and capital and operating costs. The community strongly felt that these impacts should be addressed with a comprehensive mitigation program developed in consultation with the public.
LRT	<p><i>Initial Screening:</i></p> <ul style="list-style-type: none"> • The LRT Alternative was favored by community members due to perceived high level of service frequency, speed and reliability. Another attractive factor was the ability to have direct connections with the regional rail system, thereby providing the best option for regional connectivity. Other positive comments received were that a rail system virtually cuts emissions and can operate at reduced costs when compared to buses. • The LRT Alternative was consistently ranked first or second by most individuals, and overall was the popular option. • Concerns with the LRT option included: impacts to traffic capacity and loss of curbside parking, potential property takes, construction and safety impacts, increased noise during operations and the higher cost to build. The community strongly felt that these impacts should be addressed with a comprehensive mitigation program developed in consultation with the public.
	<p><i>Final Outreach (conducted in December 2002)</i></p> <ul style="list-style-type: none"> • The public was receptive to the idea of implementing a Phased Transit Improvement approach along the corridor.

S.4 Findings and Next Steps

The Metro Rapid Alternative – with a north-south and east-west grid system of Corridor Metro Rapid service – attracts and serves a significant increase in total daily boardings and daily new transit riders. This proposed system of frequent, high-speed bus service routes was projected to attract approximately 28,000 additional daily boardings and 13, 400 daily new transit riders over No Build conditions. At this time, the Metro Rapid Alternative appears to be the most viable and cost-effective alternative and should be implemented as quickly as possible.

The two proposed additional Metro Rapid Lines – not funded by the adopted *Five-Year Metro Rapid Program* – are forecast to attract and serve a substantial number of riders, particularly the proposed line operating from the Metro Red Line Wilshire-Western Station to LAX. The Century Boulevard Line is proposed to serve the proposed LAX Intermodal Center and when the location of that facility is finalized, should be considered. These two lines merit further evaluation for future implementation.

The need for streetscape improvements to enhance transit usage was identified frequently by the community and impacted public agencies and would further enhance the attraction for both transit-reliant and choice riders. An effort should be made to work with local jurisdictions to secure funding for related streetscape improvements.

The BRT and LRT alternatives are viable future options, as there is a demonstrated need for future high-capacity transit service operating in the Corridor in a dedicated right-of-way to ensure faster travel times that are more competitive with the private automobile. At this time, the analysis shows a significant level of ridership attracted to and served by each of these alternatives, but the number of riders is offset by the high cost for both of these alternatives. These alternatives should be considered further in the future.

In the near term, the implementation of Metro Rapid lines already approved by the MTA Board is expected to achieve significant benefits in this corridor. Incremental enhancements to improve the capacity and speed of these lines should be pursued. The primary enhancements would include: working with local jurisdictions to get peak hour bus only lanes; initiating discussions with BNSF for use of the R/R right-of-way; use of articulated buses; and enhanced Metro Rapid stops.



Major Investment Study





Alternatives Considered



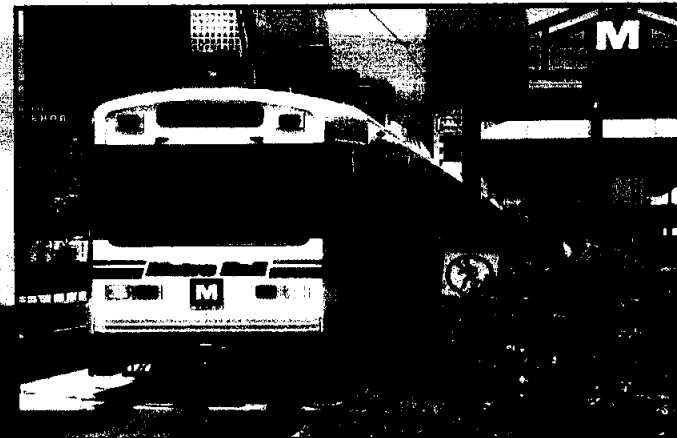
○ Existing bus service (No Build)



Bus Rapid Transit service



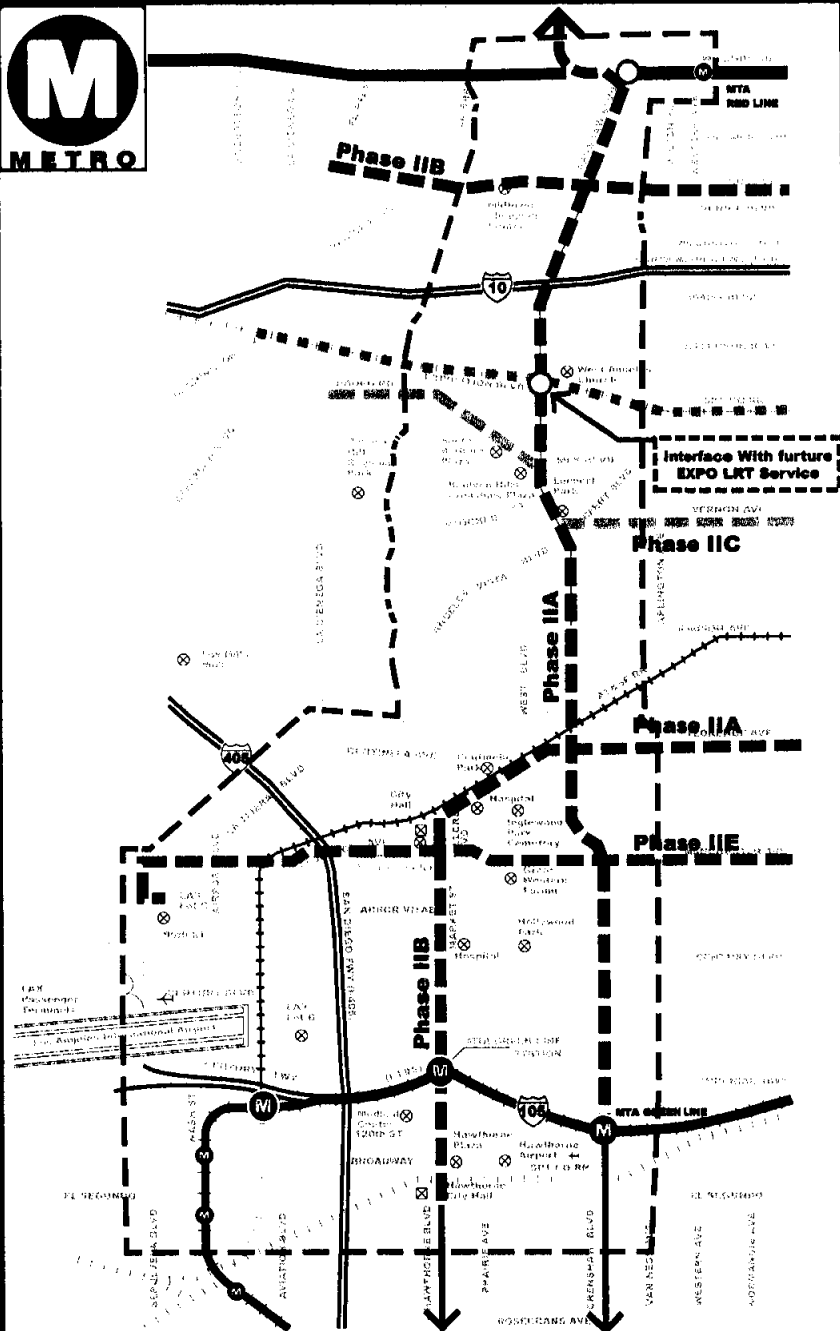
○ Metro Rapid service



○ Light Rail Transit service

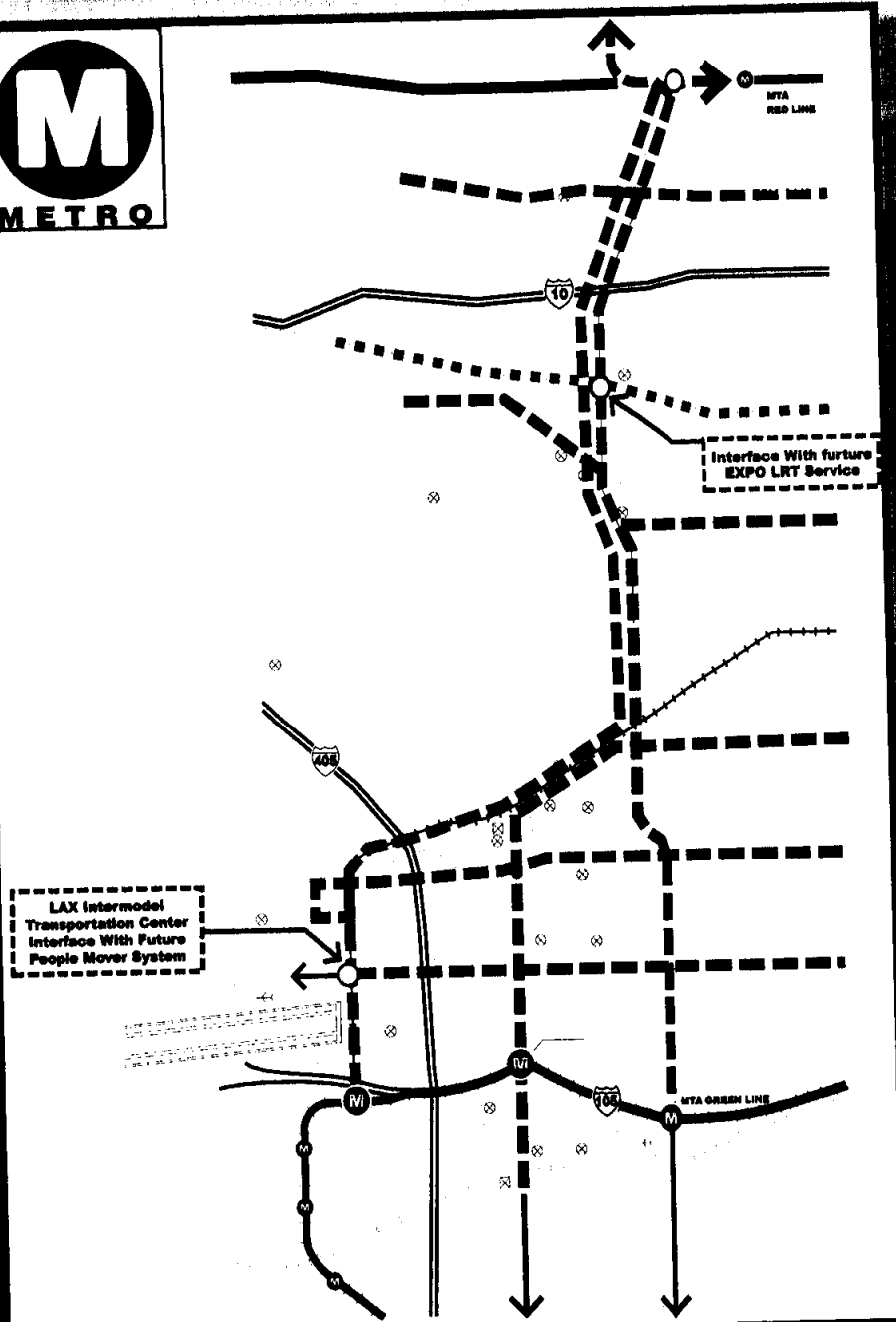


Metro Rapid System





Metro Rapid System





Metro Rapid System

Daily Total Corridor Boardings

Metro Rapid (Crenshaw)	15,900
Metro Rapid (Red line to LAX)	13,100
Metro Rapid (Flor./Hawthorne)	8,800

Total = 37,000



Cost (Millions)

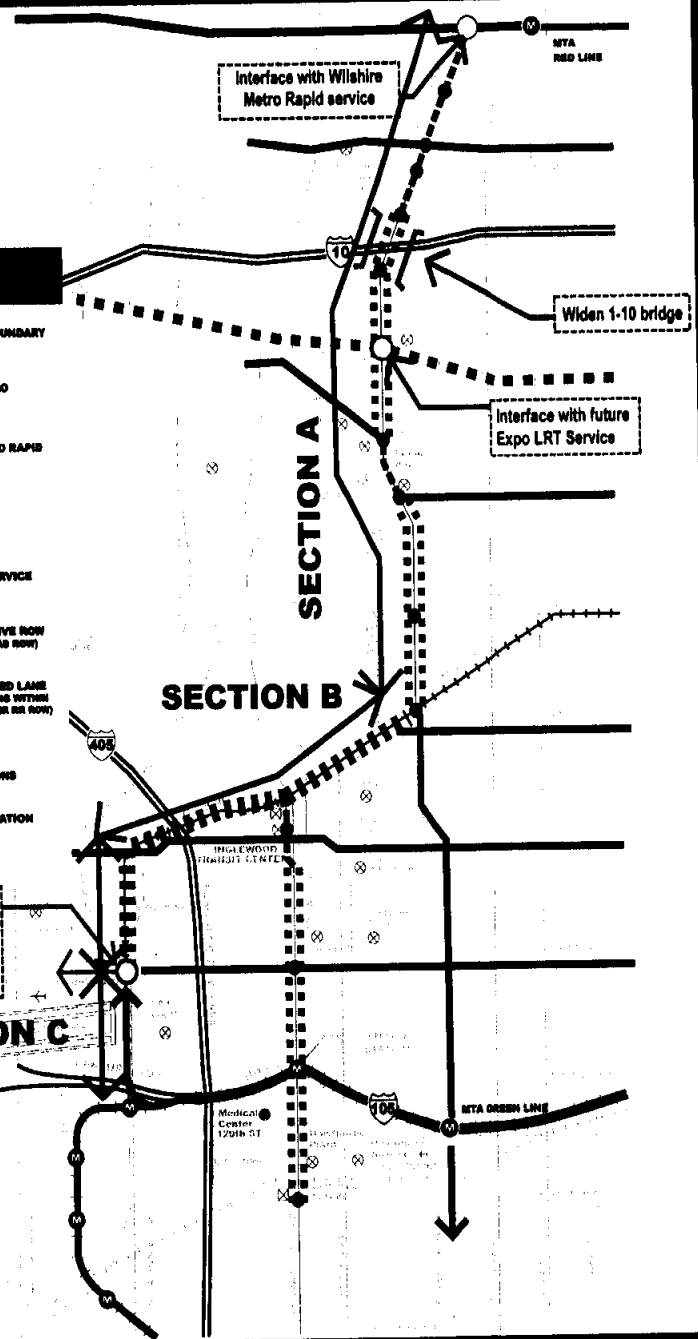
Corridor Metro Rapid Routes – 6 Lines	Committed Board Funding
Vehicles and Stations for new lines	\$5.7

Streetscape – Crenshaw	\$11 – 22
Funding from a range of sources	



LEGEND

- STUDY AREA BOUNDARY
- REGIONAL METRO RAIL LINE
- EXISTING METRO RAPID SERVICE
- FUTURE METRO RAPID SERVICE
- ■ ■ ■ ■ FUTURE LRT SERVICE
- ||||| BRT IN EXCLUSIVE ROW (FORMER RAILROAD ROW)
- BRT IN DEDICATED LANE (OPTION OPERATING WITHIN STREET OR FORMER RR ROW)
- BRT IN MIXED FLOW OPERATIONS
- BRT SYSTEM STATION



Bus Rapid Transit System

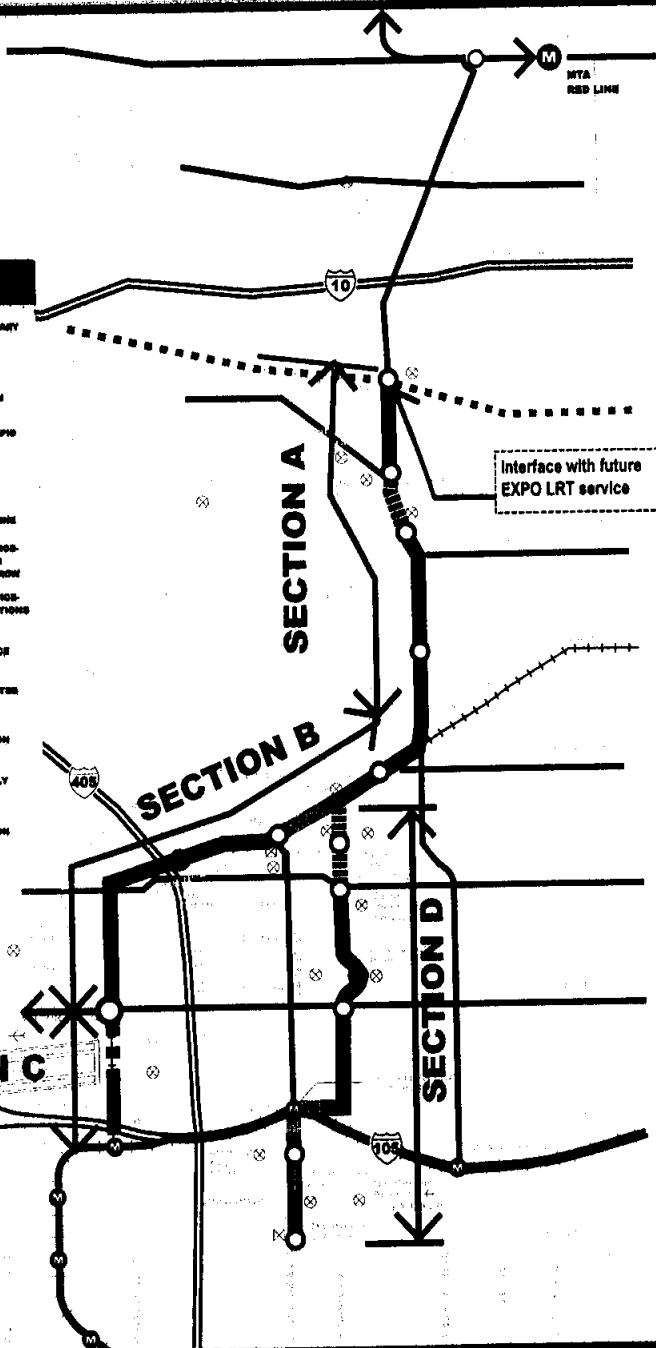
Metro Rapid (Crenshaw BRT)	15,800
Metro Rapid (Red Line to LAX BRT)	20,700

Total = 46,900



LEGEND

- STUDY AREA BOUNDARY
- INDIVIDUAL METRO RAIL LINE
- (M) METRO RAIL STATION
- EXISTING METRO RAPID SERVICE
- FUTURE METRO RAPID SERVICE
- FUTURE EXPO LRT LINE
- LRT AT-GRADE SERVICE-DEDICATED LANE OR FORMER RAILROAD ROW
- ▤ LRT AT-GRADE SERVICE-MIXED FLOW OPERATIONS
- ▤ LRT THROUGH SERVICE
- LRT GROUND-SEPARATOR SERVICE
- LRT SYSTEM STATION
- SPECIAL EVENT-ONLY LRT STATION
- FUTURE LRT STATION



LRT Base System

Metro Rapid (Crenshaw)	15,900
LRT (Expo to Aviation-LAX)	15,000

MIS Recommendations

1) Prepare a funding & implementation schedule for Crenshaw Metro Rapid enhancements including higher capacity buses, enhanced stations and segments of dedicated transit lanes for consideration by the Board, along with other potential projects, as part of the Short Range Transportation Plan;

MIS Recommendations

2) Initiate discussions with Burlington Northern/Santa Fe Railroad Company (BNSF) regarding shared use of the Harbor Subdivision railroad right of way within the Crenshaw Corridor for exclusive bus lane or possible future passenger rail use;

3) Coordinate with ongoing Los Angeles International Airport (LAX) Master Planning efforts to evaluate connections from any new LAX Intermodal Transit Center to the Crenshaw Corridor;

MIS Recommendations

- 4) Consider implementing a bus route from the Wilshire/Western Station to the planned LAX Intermodal Transit Center via the Crenshaw Corridor;**
- 5) Continue to reflect potential future implementation of light rail transit (LRT) or a 24-hour Metro Rapid Transitway in the Crenshaw Corridor in the MTA Long Range Transportation Plan.**