

ATTACHMENT D

**LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY**

Public-Private Partnership Program

Crenshaw/LAX Transit Corridor Business Plan

Prepared by
INFRACONSULTLLC

Consultants
Englander & Associates
Sharon Greene & Associates
Halcrow, Inc.
KPMG LLP
Nossaman LLP

FINAL
February 2012

Services as described in this technical memorandum are pursuant to Los Angeles County Metropolitan Transportation Authority Contract No. PS4370-2316 with InfraConsult LLC, as Prime Contractor, dated May 4, 2009. Subcontractors' services are pursuant to individual Subcontract Agreements with InfraConsult LLC, dated May 25, 2009.

TABLE OF CONTENTS

| | |
|--|-----------|
| Executive Summary | 1 |
| 1.0 Project Definition | 1 |
| 1.1. Base Project Scope | 1 |
| 1.2. Operating Scenarios | 2 |
| 1.3. Capital Costs | 3 |
| 1.4. Public Funding..... | 4 |
| 1.5. Implementation Schedule..... | 6 |
| 1.6. Status of Environmental Documents..... | 7 |
| 2.0 Evaluation Approach | 8 |
| 2.1. Objectives of the Business Plan..... | 8 |
| 2.2. Approach for Evaluation of Alternative Delivery Options | 10 |
| 2.2.1. Analysis..... | 11 |
| 3.0 Project Risks | 13 |
| 3.1. Construction Risks | 14 |
| 3.1.1. Contractor Performance Risk..... | 15 |
| 3.2. Operations Phase Risks..... | 16 |
| 3.3. Funding, Financial, Commercial and Economic Risks..... | 17 |
| 3.3.1. Funding Risks..... | 17 |
| 3.3.2. Financing Risks..... | 19 |
| 3.3.3. Economic Risks | 19 |
| 4.0 Project Delivery Options | 21 |
| 4.1. Option 1: Design-Build | 22 |
| 4.2. Option 2. Alternate Design-Build (Alt DB) | 24 |
| 4.3. Option 3. Design-Build-Finance-Maintain (DBFM) | 25 |
| 5.0 Analysis of the Delivery Options | 26 |
| 5.1. Optimize Risk Transfer | 26 |
| 5.1.1. Design and Construction Risks | 26 |

| | | |
|------------|---|-----------|
| 5.1.2. | Maintenance and Lifecycle Risks..... | 27 |
| 5.2. | Achieve Cost-Effective Use of Public Funds | 28 |
| 5.3. | Guarantee Timely Completion – Accelerate Project Delivery..... | 29 |
| 5.4. | Ensure Asset Quality Throughout Lifecycle..... | 29 |
| 5.5. | Provide Highest Quality of Service for the Traveling Public | 30 |
| 5.6. | Summary of Options Analysis Results..... | 30 |
| 6.0 | Potential P3 Financing Strategy | 33 |
| 6.1. | Options for Private Financing..... | 33 |
| 6.1.1. | Bank Debt | 33 |
| 6.1.2. | Private Activity Bonds (PABs)..... | 33 |
| 6.1.3. | Transportation Infrastructure Financing Innovation Act (TIFIA) | 33 |
| 6.1.4. | Private Equity..... | 34 |
| 6.2. | Potential Availability Payment Structure | 35 |
| 6.3. | Constraints on Metro Funding Sources Comprising an Availability Payment | 36 |
| 7.0 | Conclusions and Recommendations..... | 37 |

List of Figures

Figure 1. Crenshaw/LAX Transit Corridor Alignment 2

Figure 2. Crenshaw/LAX Transit Corridor Operating Scenario 3

Figure 3. Crenshaw/LAX Transit Corridor Measure R Revenues vs. Construction Cost Curve (in millions) 18

Figure 4. CPI Index for LA Region, CA and National (source: California Department of Finance) 20

Figure 5. Crenshaw/LAX Transit Corridor Revised Base Project Delivery Approach 24

List of Tables

Table 1. Project Construction Costs Based on Preliminary Engineering..... 4

Table 2. Summary of Project Funding Sources 5

Table 3. Crenshaw/LAX Transit Corridor Annual Revenue Assumptions 5

Table 4. Crenshaw/LAX Transit Corridor Implementation Schedule 6

Table 5. Metro P3 Program Goals and Example Evaluation Criteria..... 11

Table 6. Comparison of Contract Packaging Strategy for Project Delivery Options 21

Table 7. Comparison of Project Delivery Options Relative to Metro Goals 31

EXECUTIVE SUMMARY

Objective

The Crenshaw/Los Angeles World Airport (LAX) Transit Corridor Project is a proposed 8.5-mile light rail transit (LRT) line that will connect the Exposition Line to the north and the Metro Green Line (MGL) to the south, with continuous direct rides onto the MGL (south or east). The Crenshaw/LAX Transit Corridor will serve the Cities of Los Angeles, Inglewood, Hawthorne, and El Segundo and portions of unincorporated Los Angeles County, and will provide direct service between the Crenshaw Corridor and downtown Los Angeles, the Westside, and the South Bay. The Project extends from the intersection of Exposition and Crenshaw Boulevards to the MGL Aviation/LAX Station, and will be operated in conjunction with the existing MGL to accommodate demand for travel in north-south and east-west directions.

The alignment is a combination of at-grade and below-grade along the Crenshaw Boulevard portion of the line. Along the Harbor Subdivision of the Burlington Northern Santa Fe Railroad (BNSF), the alignment is off-street in a dedicated right of way (ROW) used infrequently by freight trains. In addition to use by the Crenshaw/LAX LRT, Metro is also studying use of the railroad ROW for a new transit line.

As shown in Figure 1, the northern terminus of the alignment begins at the intersection of Exposition and Crenshaw Boulevards and continues southward along Crenshaw Boulevard to the Harbor Subdivision railroad ROW owned by Metro. The project continues along the railroad ROW parallel to Florence Avenue and Aviation Boulevard, runs adjacent to the ends of the south runways at LAX, and connects to the MGL at Aviation Boulevard. The project has six stations in the approved plan and two optional stations that are not included in the base project definition. The below grade segments include tunneling and cut-and-cover construction approaches that are proposed to minimize environmental impacts to the community.

The total Project capital cost is approximately \$1.749 billion in year of expenditure dollars, including the cost of rolling stock. The majority of project funding (\$1.201.5 billion) is proposed from Measure R, in the form of Transportation Infrastructure Finance and Innovation Act (TIFIA) loan proceeds and cash. Other funding sources include Propositions A and C, State Bond Proposition 1B, Congestion Management Air Quality (CMAQ), Regional Surface Transportation Funds (RSTP), and Federal Transit Administration (FTA) Section 5309 Bus and Bus Related Facilities funding.

The project faces several risks in its delivery. Among the significant risks are cost overruns on scope definition (e.g.: number of stations, number of grade separations, interface with Los Angeles World Airport), construction (e.g. utility relocation, type of grade separation and the complexity of constructing in a dense urban environment), inflation due to commodity price changes and impacts on the labor market of delivering the Measure R program.

Purpose of this Business Plan

This business plan provides a qualitative assessment of selected Project delivery options originally discussed with Metro during Task 3 and throughout Task 4.

The analysis assesses three options, of which two focus on Design-Build (DB) and one focuses on Design-Build-Finance-Maintain (DBFM). The two DB options consider alternate packaging of proposed contracts, with the DB contract packaging initially under consideration by Metro serving as the base option. The DBFM option considers one integral DB contract supplemented with private financing and long-term maintenance. Each option has been assessed based on its ability to achieve Metro's goals for the P3 program. These goals are:

- Optimize risk transfer;
- Achieve a cost effective use of public funds;
- Guarantee timely project completion / accelerate project delivery;
- Ensure asset quality throughout the lifecycle; and
- Provide the highest quality of service for the traveling public.

It should be noted that this analysis was conducted prior to Metro entering into an agreement with BNSF to abandon freight service in the Harbor Subdivision segment of the Crenshaw/LAX Transit Corridor and prior to Metro's decision to procure the Project as a single DB contract covering stations, systems, and civil works, with a separate DB contract for the maintenance facility.

Delivery Options Considered

Task 3 quantified the potential cost savings of a Design-Build-Finance-Operate-Maintain (DBFOM) concession structure in which a private entity would assume responsibility for design and construction of the Project as well as operations and non-vehicle maintenance upon completion. Upon further analysis, it was determined that the Crenshaw/LAX Transit Corridor could not be feasibly operated as a stand-alone project due to its connectivity with the existing Metro Green Line (MGL) and the proposed interlining of service on the two transit corridors. The location of the Southwestern Maintenance Yard, which was finalized by Board action subsequent to the submittal of Task 3, also posed a challenge to an effectively "ring-fenced" DBFOM project, as both MGL and future Green Line extensions would require Metro-operated trains to run in parallel with privately-operated trains on a system maintained by the P3 operator.

The Consultant team then proceeded to analyze a range of alternative delivery options that excluded operation of transit service and included only non-vehicle maintenance for the civil components.

The key characteristics of the three delivery options considered in this report are as follows:

| Base DB (Option 1) | Alternate DB (Option 2) | DBFM (Option 3) |
|---|---|--|
| <p>Structured as three Design-Build contracts based on geography: Contract No. 1 would include responsibility for track work, cut-and-cover trenches, aerial structures, and stations within the Harbor Subdivision segment. Contract No. 2 would include responsibility for cut-and-cover trenches, tunnels, the design and delivery of the TBM following Metro performance specifications, and stations within the Crenshaw Boulevard segment (including box excavation), as well as systems and systems integration along the entire alignment. Contract No. 3 would include responsibility for construction of the Southwestern Maintenance Yard facility at Arbor Vitae.</p> | <p>Structured as two Design-Build contracts based on function: Contract No. 1 would include responsibility for up to 8 stations, systems and system integration; Contract No. 2 would include responsibility for all civil works components, including tunnels, cut-and-cover trenches, and track work, as well as construction of the Southwestern Maintenance Yard facility at Arbor Vitae.</p> | <p>A single Design-Build-Finance-Maintain (DBFM) contract for design and construction of up to 8 stations, track, portals, systems, systems integration, design and delivery of TBM following Metro performance specifications. The routine and capital maintenance components would be limited to non-vehicle components, including tunnels, stations and stations fixtures, escalators, elevators and all civil components for the Crenshaw/LAX Transit Corridor.</p> |
| <p>Funding and financing for the project would be as planned in the America Fast Forward iteration of the Metro Countywide Financial Forecasting Model (August 2010).</p> | <p>Same as Option 1.</p> | <p>The private developer would finance a portion of the capital costs to be repaid over the term of the contract within an annual availability payment structure. The private developer would be reimbursed through a combination of milestone payments made during the construction period and availability payments utilizing funds available to the project including Measure R programmed funds. Financing would likely be a combination of tax-exempt and taxable financing discussed in further detail in Section 6.0 of this business plan.</p> |

| Base DB (Option 1) | Alternate DB (Option 2) | DBFM (Option 3) |
|---|--------------------------|---|
| <p>Metro would perform:</p> <ul style="list-style-type: none"> ▪ Environmental impact statement and obtaining approvals ▪ Initial design activities (minimum 30% PE work) ▪ Develop performance specifications for the Tunnel Boring Machine (TBM) ▪ Acquisition of right of way (ROW) ▪ Utility relocations ▪ Vehicle procurement ▪ Rail operations and maintenance (both vehicle and non-vehicle) ▪ Routine and capital maintenance | <p>Same as Option 1.</p> | <p>Metro would perform:</p> <ul style="list-style-type: none"> ▪ Environmental impact statement and obtaining approvals ▪ Initial design activities (minimum 30% PE work) ▪ Acquisition of right of way (ROW) ▪ Utility relocations ▪ Vehicle procurement ▪ Rail operations and vehicle maintenance |

Conclusions of the Business Plan

This analysis identified several possible opportunities and challenges in delivering the Crenshaw / LAX Transit Corridor Project using DB and DBFM options relative to achievement of Metro's P3 program goals.

Based on this analysis and input from Metro staff, the Team recommends the Alternate DB approach (Option 2) for delivery of the Project. The function-based contract packaging associated with this approach reflects an optimal risk management strategy for Metro, in light of the December 2011 Board decision to approve an agreement with BNSF to abandon freight operations along the Harbor Subdivision segment of the Project. Metro's geography-based DB approach (Option 1) was originally proposed in response to the perceived need to secure the specialized expertise required for working in an active railroad ROW.

Elimination of freight operations will effectively mitigate key construction and operational risks associated with a shared ROW scenario, including technical, liability and insurance risks surrounding the design and construction of elements such as grade separations, intrusion fences, grade crossings, and drainage facilities. Additionally, curtailment of active freight operation will remove FRA requirements otherwise applicable to a shared-use corridor.

With the elimination of freight service, the right of way characteristics along the Harbor Subdivision and the northern segment of the Corridor become more similar. The design and construction risks associated with the Harbor Subdivision are accordingly reduced. As a result, corridor-wide responsibility for the completion of trackwork and systems can be more easily assigned to a single DB contractor, as proposed under Option 2.

This logic extends to other project elements as well. The ability to bundle similar construction activities and sitework in Option 2 has the potential to yield additional efficiencies and economies of scale compared to the Base DB option. For example, construction of civil works, such as tunnels and trenches, can be bundled into one contract, rather than having these same construction activities performed under both major DB contracts, as was originally proposed under the Base DB approach (Option 1). Similarly, the coordination of station design and construction under one contractor may result not only in greater bulk purchasing power for materials, but in a more consistent visual identity for the corridor, while still allowing for local neighborhood character to be reflected in individual station design.

It should be noted that any cost efficiencies yielded by an alternate DB contract packaging strategy are likely to be more limited in overall percentage terms than those already achieved by Metro's change in procurement approach from DBB to DB. The key benefits of the Alternate DB option lie primarily in reducing the number of contracts managed by Metro from three to two and offering a greater opportunity for each contractor to innovate in the delivery of Project elements across the corridor. Such innovation may result in greater cost containment if not a lower overall cost for Metro.

The implementation schedule for the Crenshaw/LAX Transit Corridor calls for the maintenance facility to be procured separately nearly a year later than the major DB contract work. This is due primarily to unanticipated delays experienced in the environmental review process for the maintenance facility and consequently its readiness to be put out to bid. That said, both the major DB contract work and the maintenance facility are anticipated to start construction at approximately the same time, in mid-2013. The recommendation of Option 2 assumes that Metro is able to align the procurement schedules and include the maintenance facility in a larger DB package comprised of the civil works components.

While a DBFM concession (Option 3) also ranks highly in this analysis and has potential to satisfy some of Metro's P3 program goals and criteria, the advantages do not merit recommendation of this procurement approach, for the following reasons:

- **Potential for cost savings and schedule certainty already captured by the change from Design-Bid-Build to a Design-Build procurement approach.** Metro has availed itself of these benefits by selecting Design-Build (DB) as its procurement approach.
- **Non-vehicle maintenance component too limited to result in major efficiencies.** Any additional cost savings to be achieved through the transfer of risk associated with a DBFM concession are likely to be limited, as the non-vehicle maintenance costs included in the concession would comprise less than 10% of total O&M costs for the Project, based on Metro's experience with its existing LRT

services as reported to the National Transit Database. The transfer of limited maintenance responsibilities to the private sector provides similarly limited opportunities for efficiencies and economies of scale.

- **Suboptimal risk transfer achievable under Design-Build-Finance-Maintain based on existing project definition and characteristics:**
 - **Project components insufficiently “ringfenced” from rest of Metro rail system.** Risk transfer is generally best achieved under a P3 procurement when all of the project components placed under the responsibility of the Private Partner are physically separate from those operated and maintained by the public entity, a concept known as “ringfencing.” The current operating scenarios propose to split service at the Aviation interlocking with operation of Metro vehicles on what would be privately maintained track along the Crenshaw/LAX Transit Corridor. Shared use of the Crenshaw Corridor by the existing MGL makes it more difficult for Metro to “ringfence” a privately-maintained asset and monitor performance by the Private Partner. The outcome may be potential ongoing disputes over the party responsible for alleged disruptions in service quality. This will be further exacerbated upon extension of the Green Line to South Bay and LAX Airport, as these other lines will traverse the Crenshaw/LAX Transit Corridor to access the Southwestern Maintenance Yard and would likely be operated as through-routed service.
 - **Difficult to tie availability payment to performance monitoring due to lack of ringfencing.** Without a more comprehensive degree of control over the system, including operations and maintenance of rolling stock components, Metro may find it more difficult to shift risk to the private sector and a potential Private Partner may be less willing to accept the risk associated with a long term availability payment-based contract.
 - **Private financing unlikely to further enhance project funding profile.** The Crenshaw/LAX Transit Corridor benefits from a strong local contribution in the form of Measure R, and the timing of those funds is already well matched to the construction cost curve. There is thus limited potential for private financing to mitigate the funding risk associated with the project. Metro currently has access to lower-cost financing through the TIFIA program.

Consideration of a Comprehensive DBFOM Option

Building upon the findings of the options analysis, the Consultant Team continues to view a comprehensive DBFOM option as having high potential for cost savings to Metro over the long term assuming the Project scope were broadened to include the operation of service and the rolling stock and non-vehicle maintenance components of both the existing MGL as well as the Crenshaw/LAX Transit Corridor.

The broader Project scope would address some of the deficiencies associated with a DBFM approach (Option 3) identified above, specifically the “ringfencing” issues and the scale of risk transfer achievable for Metro. Indeed, a more comprehensive transfer of maintenance and lifecycle responsibilities under a comprehensive DBFOM approach would allow for any fixed and managerial costs incurred by the Private Partner during

the ramp-up phase of operations to be spread out over a larger system and length of track. As such, it may offer greater opportunity and incentives for the Private Partner to realize efficiencies and economies of scale, leading to measurable long-term cost savings for Metro compared to the Base or Alternate DB approaches (Options 1 and 2).

Compared to Option 3, a comprehensive DBFOM including the existing MGL presents an optimal scenario with respect to the monitoring of asset performance, as many of the system interfaces between Metro and the Private Partner are eliminated or otherwise mitigated. It would create one continuous system to maintain, with greater ease of oversight for Metro in terms of contract management and the ability to expand the concession scope over time as new Green Line extensions to LAX Airport and the South Bay are added. It would also provide the opportunity to upgrade the MGL, including communications and track improvements.

If Metro were to consider a comprehensive DBFOM at this stage of project development, potential impacts on the current procurement schedule would need to be taken into account. Development of performance specifications for the Project and for the existing MGL, re-negotiation of existing labor contracts and changes to Metro's current practices for procurement and service delivery would be required. Such actions would likely lengthen the time needed to procure the Project beyond the timeline associated with the current two-step RFQ/RFP process, in which Metro plans to award the two main DB contracts by late 2012.

On this basis, the timeline associated with implementation of a comprehensive DBFOM option for the Crenshaw/LAX Transit Corridor and existing MGL may be inconsistent with Metro's goal of Project acceleration under the "America Fast Forward" initiative. The special status of the Project as the first to be built under this initiative lends greater weight in this analysis to schedule considerations over the potential long-term cost savings and risk transfer under a comprehensive DBFOM concession. Such trade-offs support the Team's recommendation to modify Metro's proposed packaging strategy within the parameters of a DB procurement approach, so as to maximize potential cost efficiencies without adversely affecting the Project schedule.

1.0 PROJECT DEFINITION

1.1. Base Project Scope

As shown in Figure 1, the proposed Crenshaw/LAX Transit Corridor Project alignment extends approximately 8.5 miles, from the Exposition LRT line at the intersection of Crenshaw and Exposition Boulevards to the Metro Green Line (MGL) Aviation/LAX Station. The alignment is comprised of a double-tracked right-of-way (ROW) consisting of at-grade, aerial, and below-grade guideway sections.

The proposed Crenshaw/LAX Corridor alignment's northern terminus is located at the planned Crenshaw/Exposition Station. This station will provide a pedestrian link to the Exposition Line, which is currently under construction. From the Crenshaw/Exposition Station, the alignment extends south along Crenshaw Boulevard for 3.25 miles to the Harbor Subdivision, in the process of abandonment per an agreement between Metro and the Burlington Northern Santa Fe (BNSF) Railroad. At this point, the alignment turns to the southwest and continues along the Harbor Subdivision for approximately 3.15 miles to Aviation Boulevard. From this point, the alignment continues south on the Harbor Subdivision alongside Aviation Boulevard for 2.15 miles to a connection to the MGL near the Aviation/LAX Station. The Crenshaw/LAX Transit Corridor Project as described was adopted as the Locally Preferred Alternative (LPA) by the Metro Board of Directors on December 10, 2009.

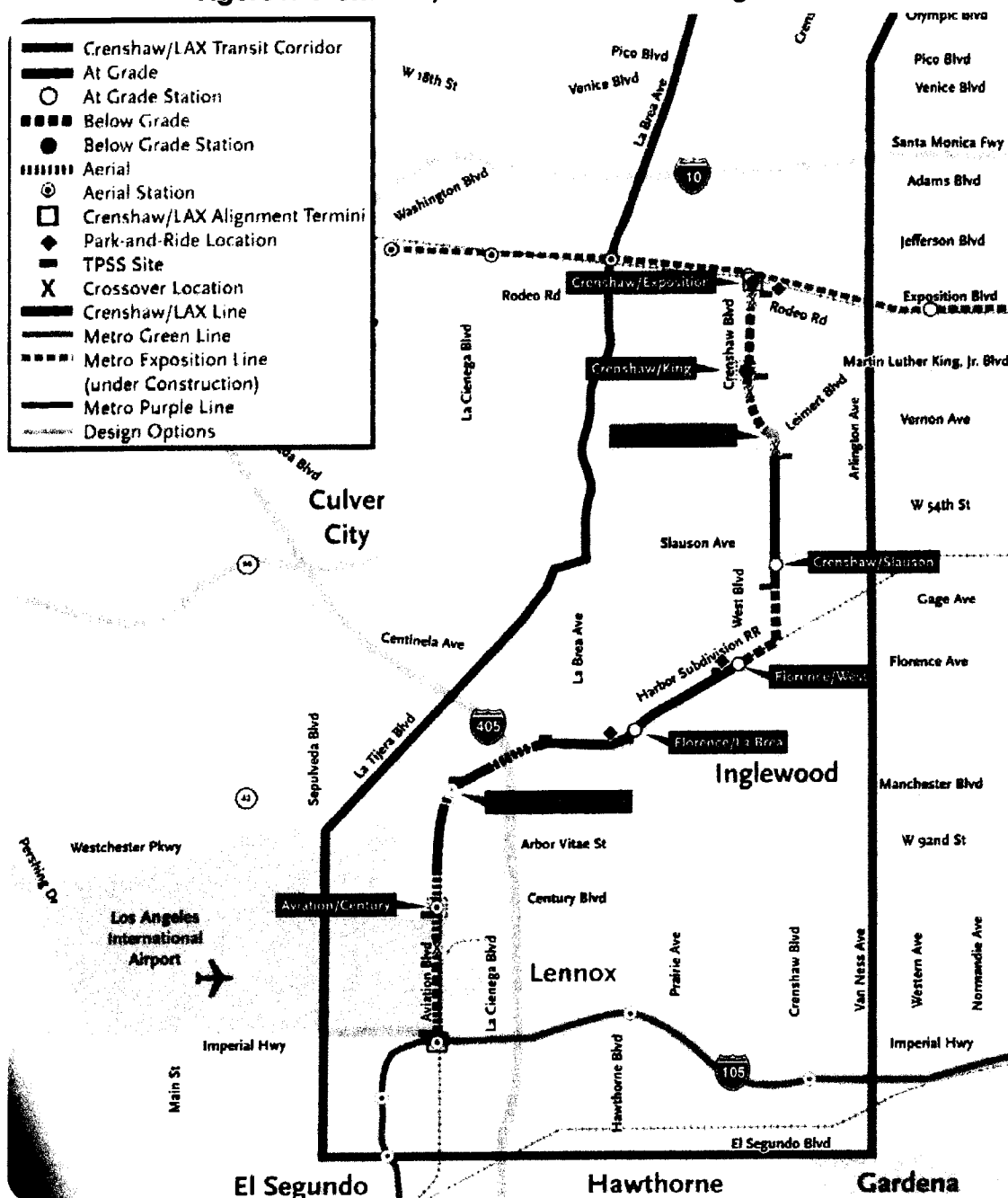
Eight stations are to be constructed at the following locations: Crenshaw/Exposition, Crenshaw/Martin Luther King Jr., Crenshaw/Vernon (optional), Crenshaw/Slauson, Florence/West, Florence/La Brea, Aviation/Manchester (optional), and Aviation/Century.

The stop at Aviation/Century will have a connection to Los Angeles International Airport (LAX) via a planned Automated People Mover. Connection to the LAX People Mover (a project currently proposed by the Los Angeles World Airports) has not been included in this scope.

The LRT alignment features crossings at a number of heavily trafficked roadways and highways, and is in proximity to the south runways of LAX. To avoid traffic delays, grade separations are being implemented at some key roadway crossings and locations: across Century Boulevard adjacent to the LAX south runways, across Manchester Avenue, across La Cienega Boulevard/I-405, across La Brea Avenue, between Victoria Avenue and 60th Street and between 48th and 39th Streets.

This Project will also require the development of a Maintenance Facility. Of the four sites considered in an Environmental Assessment/Revised Draft Environmental Impact Report (EA/Revised Draft EIR), the Arbor Vitae/Bellanca site was selected by the Metro Board at its April 28th, 2011 meeting. The Maintenance Facility will be known as "Southwestern Maintenance Yard" and shared with the existing Metro Green Line, the future South Bay Metro Green Line Extension and the Metro Green Line to LAX project.

Figure 1. Crenshaw/LAX Transit Corridor Alignment

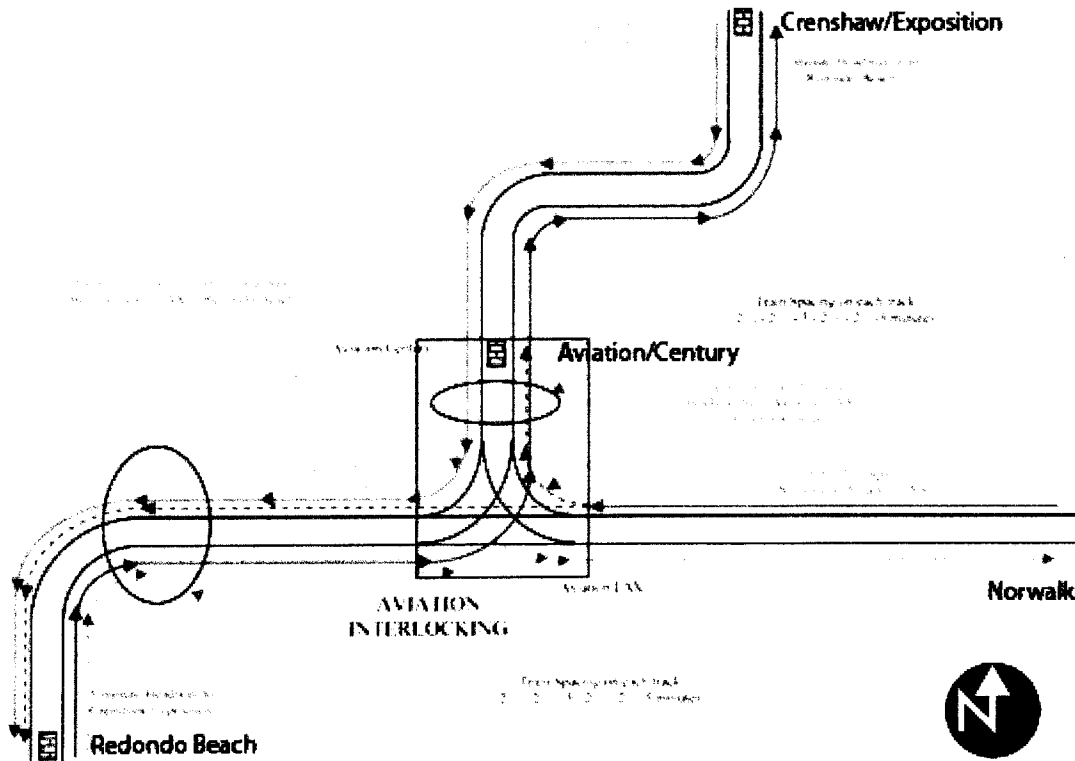


1.2. Operating Scenarios

The Crenshaw/LAX Transit Corridor Line will be operated in conjunction with the existing MGL to accommodate demand for travel in north-south and east-west directions. As shown in Figure 2, the system will be designed and built to support the following three possible service patterns:

- Crenshaw/Exposition to Redondo Beach. Crenshaw trains will depart Crenshaw/Exposition Station. At the Aviation interlocking, where the Crenshaw/LAX Transit Corridor merges with the MGL, the Crenshaw train will merge into the westbound track of the MGL towards Redondo Beach Station. The train will then turn around and go back to Crenshaw/Exposition.
- Redondo Beach to Norwalk. MGL trains departing from Redondo Beach Station will split at the Aviation interlocking, with every other train merging into the eastbound track towards Aviation/LAX Station and continuing to the Norwalk Station.
- Norwalk to Aviation/Century. MGL trains departing from Norwalk Station will split at Aviation/LAX, with every other train merging into the northbound track on the Crenshaw/LAX Transit Corridor and terminating at Aviation/Century, where connecting service to LAX Airport will be provided via a future Green Line extension currently being planned.

Figure 2. Crenshaw/LAX Transit Corridor Operating Scenario



1.3. Capital Costs

As summarized in Table 1, the estimated capital cost of the Project is \$1,749.0 million YOE. This cost is \$34.4 million higher than the \$1,715.0 million YOE baseline Life-of-Project budget adopted in Metro's 2009 Long Range Transportation Plan. The higher estimate reflects the revised Life-of-Project budget adopted by Metro in October 2011 and

includes design modifications developed as part of the project Preliminary Engineering work, vehicle procurement, and a contingency of 24% (both allocated and unallocated). It does not include the financing costs associated with the Project.

Table 1. Project Construction Costs Based on Preliminary Engineering

| Cost Category | YOE \$ (millions) |
|----------------------------|-------------------|
| Construction | \$1,133.6 |
| Right-of-Way | \$69.2 |
| Vehicles | \$87.8 |
| Professional Services | \$257.6 |
| Unallocated Contingency | \$174.8 |
| Planning and Environmental | \$26.0 |
| Total Project Costs | \$1,749.0 |

Consistent with its Final Unified Cost Management Process and Policy, Metro conducted a value engineering workshop in July 2011 to identify potential savings, including cost reduction strategies, design refinements, and contracting strategies to align costs before adopting the revised Life-of-Project budget. Potential savings/scope changes are still under consideration.

1.4. Public Funding

For the capital costs of the project, Metro has committed a total of \$1,715.0 million YOE in public funding from a variety of local, State, and federal sources. In addition to these revenues, Metro proposes to reallocate \$34.4 million in unexpended funding from another project to the Crenshaw/LAX Transit Corridor for a total of \$1,749.0 million. The sources and levels of funding for the Project are summarized in Tables 2. Other than the level of Measure R funds which are voter-approved, the specific mix of funds is subject to change.

The construction period is scheduled to begin in FY 2012 and end in FY 2018, with revenue service anticipated to begin in October 2018. Annual capital revenue assumptions are shown in Table 3.

Table 2. Summary of Project Funding Sources

| Source | Funding Level | Percent of Total Funds |
|---|------------------|------------------------|
| Local | | |
| Proposition A 35% | \$4.8 | 0.3% |
| Local Agencies | \$52.4 | 3.0% |
| Proposition C 25% | \$154.4 | 8.8% |
| Measure R TIFIA | \$545.9 | 31.2% |
| Measure R Cash | \$655.6 | 37.5% |
| State | | |
| Proposition 1B PTMISEA account | \$201.2 | 11.5% |
| Regional Improvement Program | \$36.7 | 2.1% |
| Federal | | |
| FTA Section 5309 Bus and Bus Related Facilities | \$8.6 | 0.5% |
| Congestion Management and Air Quality (CMAQ) | \$68.2 | 3.9% |
| Regional Surface Transportation Program (RSTP) | \$20.0 | 1.1% |
| Federal Other | \$1.2 | 0.1% |
| TOTAL | \$1,749.0 | 100.0% |

Table3. Crenshaw/LAX Transit Corridor Annual Revenue Assumptions

| Sources | Prior | FY 12 | FY 13 | FY 14 | FY 15 | FY 16 | FY 17 | FY 18 | FY 19 | FY 20 | Total \$ | Total % |
|------------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|--------------|------------------|--------------|
| Local | | | | | | | | | | | | |
| Prop A 35% | \$4.8 | | | | | | | | | | \$4.8 | 0.3% |
| Local Agencies | | | | | | \$51.4 | | \$1.0 | | | \$52.4 | 3.0% |
| Prop C 25% | \$4.1 | | | \$14.7 | \$102.6 | | | \$26.6 | \$6.4 | | \$154.4 | 8.8% |
| Measure R TIFIA | | | | | | \$139.9 | \$309.1 | \$96.6 | \$0.3 | | \$545.9 | 31.2% |
| Measure R Cash | \$545.9 | | | \$246.3 | \$234.8 | \$142.8 | | | \$11.0 | \$3.6 | \$655.6 | 37.5% |
| State | | | | | | | | | | | | |
| Prop 1B PTMISEA | | \$39.1 | \$131.8 | \$30.3 | | | | | | | \$201.2 | 11.5% |
| RIP | \$2.3 | | | | \$34.4 | | | | | | \$36.7 | 2.1% |
| Federal | | | | | | | | | | | | |
| FTA Sec 5309 Bus | \$8.6 | | | | | | | | | | \$8.6 | 0.5% |
| CMAQ | | | | \$14.2 | \$54.0 | | | | | | \$68.2 | 3.9% |
| RSTP | | | | | \$20.0 | | | | | | \$20.0 | 1.1% |
| Fed Other | \$1.2 | | | | | | | | | | \$1.2 | 0.1% |
| TOTAL | \$38.1 | \$39.1 | \$131.8 | \$291.3 | \$386.0 | \$408.0 | \$309.1 | \$124.2 | \$17.7 | \$3.6 | \$1,749.0 | 100.0 |

The majority of funding comes from local sources (80.8 percent), including Proposition A, Proposition C, local, and Measure R. The latter provides the largest share of the total, in the form of \$655.6 million in Measure R cash and \$545.9 million for repayment of Transportation Infrastructure Finance and Innovation Act (TIFIA) loan proceeds, for a total of \$1,201.5 million (68.7%).

1.5. Implementation Schedule

The following table summarizes Metro's planned federal (and State) environmental clearance, procurement and implementation schedule.

Table4. Crenshaw/LAX Transit Corridor Implementation Schedule

| Date | Event |
|----------------------------------|---|
| August 2011 | FEIR/FEIS completed Industry review |
| September 22, 2011 | Board adoption of FEIR/FEIS |
| December 23, 2011 | RFQ Step 1 released |
| December 30, 2011 | ROD issued by FTA |
| January 2012 | Completion of BNSF agreement to abandon Harbor Subdivision |
| March 2012 | Preliminary design completed RFP Step 2 - technical/price proposals submitted |
| July 31, 2012 | TIFIA loan closing |
| September 2012 | Groundbreaking on advance utility work |
| –November 15, 2012 | Contract(s) awarded Issue Notice to Proceed |
| June – August 2013 | Start of major construction |
| October 2017 | Substantial completion of construction |
| November 2017 – February 2018 | Testing and revenue operations |

The Final Environmental Impact Report/Final Environmental Impact Statement (FEIR/FEIS) was delivered on schedule on August 31, 2011 with Metro Board adoption scheduled at the September 2011 meeting. The Record of Decision (ROD) was issued by the Federal Transit Administration (FTA) on December 30, 2011.

The Project is currently anticipated to be procured over a twelve-month period through one major Design-Build contract under a two-step Request for Qualifications/Request for Proposal (RFQ/RFP). In the first step, procurement documents with pre-qualifications were released in late December 2011 in conjunction with issuance of the ROD; in the second, the technical/price proposals are to be submitted in March 2012. Based on this schedule, the major DB contract work would be awarded November 2012, with start of

major construction in Summer 2013. A separate Design-Build contract for the shared maintenance facility is to be procured on a parallel schedule, with a contract award anticipated in early 2013 and start of construction in mid-2013.

Construction contracts would be substantially completed by October 2017, with revenue service scheduled to begin in early 2018.

1.6. Status of Environmental Documents

Concurrent with the adoption of the FEIR/FEIS, a design option for an additional underground station to be located at an intermediate location between the planned Martin Luther King Jr. and Crenshaw/Slauson stations was requested and added by the Metro Board. The option for an additional underground station at Crenshaw/Vernon or an at-grade station at Crenshaw/48th Street to serve the Leimert Park neighborhood was not included in the original project scope analyzed by the EIR/EIS and would require supplemental analysis. While the potential impacts of an additional station at Leimert Park have yet to be environmentally cleared, the parcels that Metro would need to acquire in order to accommodate the additional station have already been cleared as potential takings in the current FEIR/FEIS, thereby allowing Metro to preserve the additional station as a bid option in the RFP to be released in March 2012.

2.0 EVALUATION APPROACH

This section describes Metro's goals for the Public-Private Partnership (P3) program and provides details of the methodology used to develop and assess the delivery options for the Project.

2.1. Objectives of the Business Plan

Under this Task 4 of the P3 Program, the InfraConsult Team has been requested to develop a business plan, including a review and analysis of potential delivery options for the Project, one of six (6) Measure R program projects selected by Metro, following an initial screening completed in Tasks 1 & 2, and an initial quantitative analysis completed in Task 3. The objective of this business plan is to provide a qualitative assessment of possible delivery options for the proposed Project.

Throughout its engagement on the P3 Program, the Team has followed an iterative process in its analysis of each individual Project, refining the range of possible delivery options in response to additional findings and changes in Metro's base procurement approach. In the case of the Crenshaw/LAX Transit Corridor, two such refinements have occurred since the submittal of the Task 3 report to Metro in January 2011:

- The Metro Board passed a motion in March 2011 authorizing Metro staff to utilize Design-Build (DB) as its base procurement method, citing a variety of potential advantages including "certain private sector efficiencies in the integration of design, project work and components of the Crenshaw/LAX Transit Corridor Project...a reduction in the number of changes and claims from multiple prime contractors, additional efficiencies in project management, administration and coordination, and design features not achievable through the DBB process." These advantages were similarly highlighted by the Consultant Team in its Task 3 report.

Metro's adoption of DB as the preferred delivery approach resulted in a need for the Consultant Team to update the risk transfer assumptions that formed the basis of the cost savings comparison between Design-Bid-Build (DBB) and Design-Build-Finance-Operate-Maintain (DBFOM) in Task 3. As Metro is already taking advantage of the value engineering potential of a DB approach, one of the major value drivers achieved by a P3 approach, namely the risk adjustment applied to the construction cost in comparison to the DBB approach, is no longer operative. Indeed, in the Crenshaw/LAX Transit Corridor capital cost estimate developed by Metro (see Section 1.3), the cost savings associated with DB are already reflected in the percentage of the project budget devoted to "soft" costs and professional services.¹

¹ "Soft" costs (SCC 80) as a percentage of "hard" costs (SCC 10-50) for Crenshaw/LAX Transit Corridor is 26.5%, compared to ~33% for Westside Subway Extension, which is anticipated to be procured as a Design-Bid-Build project. This reduction accounts for the efficiencies achieved under the Design-Build approach.

- As part of the Task 3 report submitted to Metro in January 2011, the Team performed an initial analysis comparing a DBB and DBFOM delivery approach for the Project, in which a private developer would take the responsibility for design, construction, financing, operations and maintenance under one P3 contract. The results of this analysis indicated that as compared to a DBB delivery approach, a DBFOM approach may present a lower project cost in today's dollars on a present value basis.

Upon further examination, it was determined that the inclusion of transit operations under a DBFOM would only be feasible if the Crenshaw/LAX Transit Corridor and existing MGL were to be combined into a single entity. As outlined in Section 1.2, the operating scenarios for the Transit Corridor call for split service at Aviation/Century, with some MGL trains proposed to share use of the Crenshaw/LAX Transit Corridor ROW and vice versa. If the system was not combined into a single entity, Metro would retain operations and maintenance responsibilities on the MGL and a Private Partner would be responsible for operations and maintenance on the Crenshaw/LAX Transit Corridor. Such an operating scenario presented potential issues associated with both public and private operators providing service on a common corridor, coupled with the difficulty of keeping the two operations distinct and sufficiently "ringfenced" for performance monitoring purposes. Therefore, the DBFOM option was not carried forward in the Task 4 analysis and transit operations were removed from further consideration as a potential element of the alternative procurement approaches.

Based on these findings and changes in approach, the range of delivery options available for selection in Task 4 falls between the following two delivery options, each representing one end of a spectrum of risk transfer:

- Design-Build (DB) - under which a private entity would take the responsibility for design and construction while Metro would retain the responsibility for operations, maintenance and finance with limited risk and responsibility transferred to a private entity; and
- Design-Build-Finance-Maintain (DBFM) - under which a private entity would take the responsibility for design, construction, financing and maintenance (non-vehicle) under one P3 contract.

Lastly, a third potential delivery option is a Design-Build-Finance (DBF) approach under which Metro would transfer the responsibility for project financing, in addition to design and construction. An assessment of this option has not been included at this time for the following reasons:

- DBF is typically used where the profile of project expenditures does not match the timing of expected funding or if access to additional funding could accelerate project delivery. In such cases, potentially higher costs associated with private financing could be offset by cost savings from reduced inflation impacts. In the case of Crenshaw / LAX, Metro's existing plans match costs and revenues.

- DBF is typically applied to relatively smaller projects (recent US projects have been under \$500 million) and used on a short term basis (less than 10 yrs). The Crenshaw / LAX Project is greater than \$1 billion.

2.2. Approach for Evaluation of Alternative Delivery Options

As part of its P3 Program, Metro identified five major goals and example evaluation criteria for delivery of its Measure R program. The criteria were used to assess the relative ability of various project delivery approaches to achieve these goals, including cost certainty, cost savings, schedule certainty, project delivery acceleration, risk transfer optimization, lifecycle cost savings, and service quality. These goals are to:

- **Optimize risk transfer.** As the project sponsor, Metro typically retains responsibility for all risks related to right-of-way acquisition, permitting, environmental clearance, and public acceptability. Under a P3 procurement, a developer shares certain risks related to project delivery and/or performance that Metro would otherwise manage. A project's risk profile can be "optimized" by allocating a given risk to the party best able to manage it. The benefits of this approach include enhanced certainty of project price and delivery schedule. The potential cost of the risk transferred will be included in the developer's bid price.
- **Achieve the most cost-effective use of public funds.** Metro has identified cost containment as a major policy consideration in the implementation of its Measure R program. By exploring alternative delivery options, Metro may be able to leverage public sector funds and resources, achieve price certainty and enhance value for money.
- **Guarantee timely project completion and/or accelerate project delivery.** In its policy statements, Metro has emphasized the importance of schedule certainty, both for financial and public acceptability reasons. The delivery of projects on-time enhances credibility with the public and allows for better budget management and planning. Metro desires to accelerate transit project delivery as the region's highways face capacity constraints.
- **Ensure asset quality throughout project lifecycle.** Metro's objectives for the P3 program include ensuring that the ongoing quality of assets included in the project scope is maintained to a high standard throughout the proposed analysis/contract period.
- **Provide highest-quality service for the traveling public.** Regardless of project delivery model, Metro has identified a key objective to be that the quality of service should match the same high performance standards that Metro already offers.

As shown in Table 5, example evaluation criteria were developed to guide the assessment of each project delivery option's potential to fulfill the goals of Metro's P3 Program.

Table 5. Metro P3 Program Goals and Example Evaluation Criteria

| Goals | Example Evaluation Criteria |
|---|--|
| Optimize risk transfer | Transparency/availability of information for private sector to price risks and submit "fixed price" bid |
| | Ease of modifications required to adapt existing service contracts |
| | Flexibility of the proposed project to enable private-sector innovation |
| | Compatibility of procurement method with regulatory requirements (Buy America/labor law/local hire/alternative fuel/green construction policies, etc.) |
| | Ability of private sector to comply with insurance requirements (potential capacity issue) |
| Achieve a cost-effective use of public funds | Price certainty to Metro |
| | Certainty and quantum of project funding streams, both short and long term |
| | Maximum leveraging of public funds |
| | Ability of option to provide greater access to alternative sources of finance |
| | Metro control over fare setting and revenue sharing with private sector partner |
| Guarantee timely completion-Accelerate project delivery | Ability to guarantee schedule certainty |
| | Potential to accelerate project delivery |
| Ensure asset quality throughout lifecycle | Ability to measure/monitor contractor performance/output on lifecycle |
| Provide highest-quality service for the traveling public | Ability to achieve operational performance/quality and safety for the traveling public |

2.2.1. Analysis

The analysis of alternative delivery options has been completed in two stages. The first stage is to identify and summarize risks identified to date for the Crenshaw/LAX Transit Corridor Project and documented by the Metro Project team. Risks have been categorized as follows:

- Construction risks;
- Operational and maintenance risks; and
- Funding and financial risks.

Following the identification of the major risks associated with the project in Section 3.0, the analysis then seeks to explore the degree to which potential delivery options fulfill Metro's P3 Program goals through the management and mitigation of project risks identified.

Section 4.0 describes in greater detail the contract packaging strategy and overall scope of each project delivery option. The analysis of those options against Metro's goals is subsequently documented in Section 5.0.

3.0 PROJECT RISKS

This section presents a qualitative summary of the technical, financial and economic risks that Metro may encounter in delivering the Crenshaw / LAX Transit Corridor Project, prior to any consideration of an adopted procurement approach. The focus is mainly on technical risks related to meeting the project objectives with respect to cost, schedule and quality. The analysis is split into three sections representing the main areas of project delivery risk:

- Design and construction risks affecting cost and schedule;
- Long-term asset maintenance, rehabilitation and replacement (i.e. lifecycle) risks; and
- Funding, financial, and economic risks.

Metro has carried out several analyses on the construction cost and schedule risks associated with the delivery of the Project. The information in this section has been extracted and summarized from three main sources:

- Crenshaw / LAX Transit Corridor Risk Assessment Report dated May 31, 2011
- Crenshaw / LAX Transit Corridor Risk Workshop Handbook dated March 2011
- Crenshaw Transit Corridor Final EIS/EIR Chapter 8 – Financial Analysis and Comparison of Alternatives

In addition to these Metro sources, the discussion below also incorporates risk analysis carried out by the Consultant team as part of its Task 3 Strategic Assessment report. Several key project risks have been identified during the Project risk analysis work. These are summarized as below.

- Inflation of the Project capital costs (described further below), which can be driven by both demand and supply at global and regional levels. A major impact can occur when actual cost inflation exceeds the estimated / forecast rate of inflation included in the financial forecast.
- Right-of-way costs correlated to property values. In recent years both national and regional property values have declined following many years of growth, often above historic averages. Uncertainty exists regarding the potential recovery of the property market, both in terms of timing and forecast annual growth figures. Combined with specific site conditions, this will greatly influence the uncertainty of ROW costs.
- Concurrent implementation of multiple large infrastructure projects within Los Angeles County. This has the potential to limit the availability of qualified labor. If there is insufficient qualified labor, capital cost escalation can occur through unit cost increases over and above those forecast in the project budget. Qualified labor includes design and project management professionals as well as construction workers.

- Schedule delays will lead to overall cost delays, both in cost escalation and increased professional service costs. Schedule delays are often caused by a change in scopes of work, delays to local permitting and approval processes, stakeholder negotiations and agreements, ROW acquisition, utility relocations, procurement and authorization delays, together with general construction delays.
- Scope change and design risk arising from unexpected utility relocations as well as ground, geological, and environmental conditions can have a significant impact on the project budget.
- Delays associated with the availability of project funding. As the first of the major transit corridors in the Measure R program to be implemented, the Crenshaw / LAX Transit Corridor Project is funded at a cost not to exceed \$1.715 billion (YOE \$). Delays in receipt of funding and financing and potential changes in scope could potentially affect Metro's ability to deliver the project within budget.

3.1. Construction Risks

Construction phase risks arise from uncertainties such as project scope, physical constraints, stakeholder needs, contractor performance and the occurrence of unforeseen events that ultimately act to increase or decrease the final cost of the Project and accelerate or delay its completion date. As design progresses many of these uncertainties will be resolved, for example, uncertainty in ground conditions will be reduced following more extensive geotechnical investigations. Until the issues are resolved, these risks will be allowed for in the cost and schedule of project in the form of contingencies.

The following list summarizes the main risk issues that may impact Project delivery during the planned construction phase of the Project.

- Uncertainty over the final scope of work, including the amount of tunneling required as compared to an at-grade alignment and additional stations;
- Complexities of constructing the new transit alignment in a busy urban developed corridor, with an existing LRT route, including the interface with existing traffic flows, pedestrians, traffic management systems;
- Interface with LAX and Federal Aviation Administration for design and approvals;
- Expansion of the Metro Operations Center may not be completed in time for the Crenshaw/LAX Transit Corridor project, and/or additional shares of cost will be attributed to the Crenshaw/LAX Transit Corridor project as other America Fast Forward planned projects are delayed;
- Uncertainty over the depth of the existing utilities, particularly at intersections in the cut and cover sections of the project. This can lead to an increase in complexity of the utility relocations and subsequent increase in overall cost and schedule; and
- Complexity of the utility locations and relocations may delay construction.

3.1.1. Contractor Performance Risk

A performance bond is a promise by the contractor that the contractor will complete the work, and a promise by the surety that it will take one of the following actions if the contractor fails to perform: (a) step in to finish the work, (b) find another contractor to finish it, or (c) pay damages to the owner, up to the limits stated in the bond. In the event of a contractor default, the bond covers the risk of cost overruns over and above the contract price.

Prior to the construction phase, as a qualification for submitting a bid during the procurement process, potential contractors must have sufficient financial capacity to obtain performance bonds, in some cases equal to the monetary amount of the individual contract packages.

Limits on the amount of performance bonding available to individual contractors vary, with limits for a small pool of larger contractors in the neighborhood of \$250 million per contract. For projects with performance bond requirements exceeding that amount, the larger contractors may form joint ventures to enable the bonding requirements to be met. The ability of the contractor(s) to obtain performance bonds for very large contracts represents a procurement risk.

Under the Transit Design-Build (DB) Law (Public Contract Code section 20209.5 et seq.), Metro has discretion to determine the amount of the performance bond, within the parameters of a statutory requirement that the amount must be sufficient to cover the design-builder's services. Since the projects will be federally funded or financed, FTA policy must also be taken into account. FTA requires grantees to obtain performance bonds from their construction contractors in an amount equal to 100 percent of the contract price unless a lower amount or alternative security is justified. For large transit projects such as Metro's, FTA is generally willing to approve a reduced bond amount, recognizing that a 100 percent bond is not necessary to cover the risk and that a requirement to obtain a 100 percent bond would severely impact competition. Other transportation agencies with federally-funded projects have used a range of performance security requirements for their projects.²

² The FTA recently approved a 50 percent performance bond for the Santa Clara Valley Transportation Authority's Silicon Valley Berryessa Extension Project, expected to cost \$800 million. For the Denver Regional Transit District's (RTD) Eagle P3 concession agreement, awarded in 2010, FTA approved an alternative approach to performance security for the project, allowing the Private Partner to provide either a payment/performance bond or letter of credit. The amount of the security for the Eagle project is set annually, equal to 50 percent of the total earned value of the design-build work for the upcoming year plus 5 percent of the value of future work. Given the six-year completion schedule, the required security is significantly less than 100 percent of the value of the design-build work. The Denver RTD request for approval relied heavily on the fact that the Private Partner would be providing financing.

It should be noted that reducing the amount of a performance bond does not directly result in a premium reduction, because the premium is determined based on the level of risk associated with the project. Even though the surety's potential total exposure is reduced when the bond amount goes down, the surety's primary risk is for the "first dollars" out, and the likelihood that the surety will be called upon to pay cost overruns does not change just because the bond amount is lower. For this reason, it is not uncommon for

Under the procurement approaches analyzed as part of the business plan, the consolidation of multiple contracts into a single contract is cited as a potential advantage for Metro, as it reduces the number of interfaces that must be managed by the agency in its oversight of a project. At the same time, Metro's approach to contract packaging must consider its duty to ensure that performance security will be sufficient to cover the project risks. Metro should also consider the impact of larger contract packages on the ability of smaller contractors to participate as principals, and on the number of teams able to propose, with the resulting impact on level of competition and predictable increase in Metro's costs.

In determining an appropriate performance bond amount, Metro should take into account the project risks to be covered by the bond, conditions in the surety markets, limitations affecting formation of teams, and the maximum amount that potential teams would be able to bond.

3.2. Operations Phase Risks

Maintenance costs can be highly uncertain during the preliminary engineering of projects due to unknown final scope, unknown mechanical and electrical equipment, unknown operating procedures, the complex interaction between preventive maintenance and replacement cycles and unknown economic factors such as inflation that have significant impact on the cost of activities that are many years away.

The following list summarizes the main risk issues that may impact the cost of long term asset maintenance, rehabilitation and replacement:

- Uncertainty in using past cost data to predict future costs;
- Uncertainty in real growth of maintenance costs over an extended time period (note that the Project operations and maintenance estimate only provides the cost in a single horizon year, 2035);
- Materials, utilities, labor, and equipment cost inflation;
- Unexpected soil conditions may reduce the life of the subsurface structures, for example corrosion of tunnel lining and tunnel / station steel reinforcement from acidic soil;
- Deferred or poorly performed routine maintenance that can accelerate the deterioration of assets resulting in reduced life and higher costs of major rehabilitation or replacement;
- Obsolescence of system components such as communications, signals and other systems;

project owners (such as the Denver RTD) to accept letters of credit or other alternative performance security for P3 projects, since the premiums to obtain a letter of credit are based on the value of the letter of credit rather than on the cost of the project.

- Excessive wear and tear due to change in conditions that exceed design specifications, e.g. higher than expected volume of passengers using elevators and escalators;
- Uncertainty in cost of equipment replacement, not only of the equipment itself but the soft costs of installation e.g. due to restricted working hours, working at night etc.;
- Poorly installed equipment / low quality components / poor quality construction that may result in increased maintenance costs and an unexpected need for replacement outside of warranty period; and
- Change in maintenance standards, procedures and safety standards such as working hours.

3.3. Funding, Financial, Commercial and Economic Risks

There are a number of funding, financial, commercial, and economic risks to be considered. These include the ability to accurately forecast year of expenditure amounts, the risk of increasing project costs or delay due to Project scope changes or external impacts to schedule, the ability to execute planned financing strategies or the availability of financing within the market. The key Project risks are discussed as follows.

3.3.1. Funding Risks

Recent developments at the State and federal level have increased the risk that the sources of non-local funding assumed for the Crenshaw/LAX Transit Corridor may not be available as scheduled.

Future reductions in formula-based federal programs for transit, for example, such as the Congestion Management and Air Quality Improvement (CMAQ) program, could impact the level of funding available for the project, which is to receive a total of \$68.2 million of CMAQ funds in FY 2015 and FY 2016.

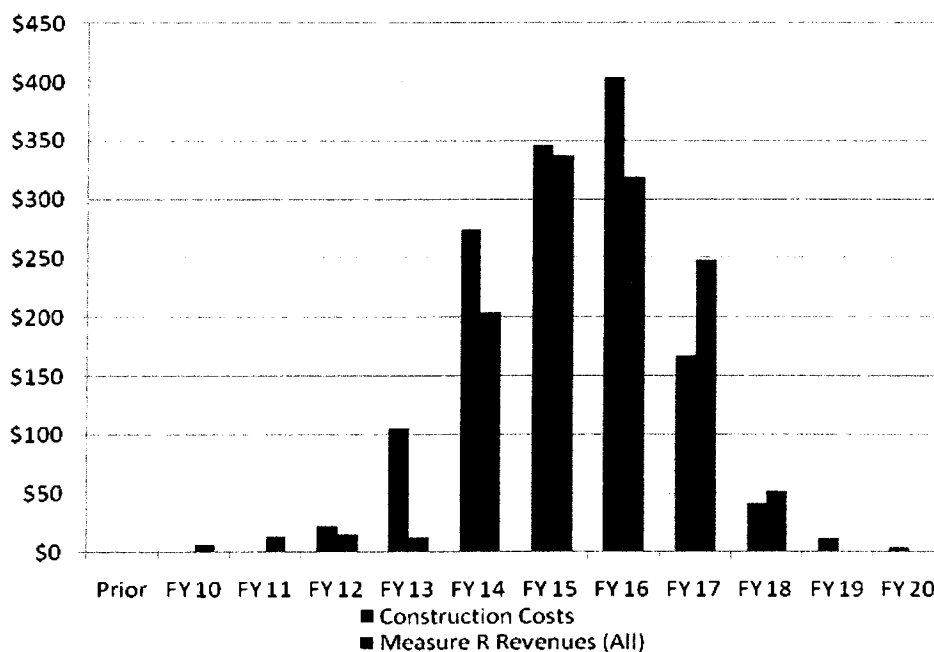
Potentially most at risk are \$201 million in State Proposition 1B funds committed to the project. These are scheduled to be available starting in FY 2012 and continuing through FY 2015, during the most capital-intensive phase of the six-year construction period. The availability of these bond proceeds depends on the financial rating of the State of California and its capacity to accommodate additional debt service. In March 2011, the State chose to delay a \$2.3 billion Proposition 1B bond sale in order to save \$250 million in debt service amid the ongoing budget crisis. By law, the remaining balance of Proposition 1B bond funds must be issued by the end of 2012. Failure to do so could jeopardize the timely completion of numerous State transportation projects, including this one.

That said, implementation of the Project relies primarily on local sources, namely Measure R. In contrast to other transit projects comprising Metro's broader "America Fast Forward" initiative, such as the Westside Subway Extension or the Regional Connector, the Crenshaw/LAX Transit Corridor is not a recipient of FTA New Starts

funding and its exposure to future changes in federal funding levels remains fairly limited.

Furthermore, Metro has programmed Measure R revenues for the project in the first decade of the 30-year sales tax measure, in a manner generally congruent with the construction cost curve³ of the project from FY 2012 through FY 2018, as shown in Figure 3. By ensuring the availability of revenues that are locally generated, controlled, and sufficient to cover the majority of costs during the construction phase, Metro's programmed schedule of Measure R cash flows reduces the funding risks associated with the Project's implementation.

Figure 3. Crenshaw/LAX Transit Corridor Measure R Revenues vs. Construction Cost Curve (In millions)



The schedule of Measure R cash flows also broadens the range of potential options with regard to private finance. Section 6.0 explores the potential for a private developer to replace Measure R revenues during the FY 2012 to FY 2018 construction period with private equity or debt financing. This approach could increase Metro's flexibility in funding other "America Fast Forward"/Measure R-dependent transit projects also scheduled to begin construction in the first decade.

It should be noted that the availability of private financing for the Project could help supplement the proposed sources of capital and thereby mitigate risks associated with the timing of these public funding streams; however, the appropriate level of public funding would still be required over the term of the concession to service availability payments.

³Construction cost includes standard cost categories (SCC) 10, 20, 30, 40, 50, and 80.

3.3.2. Financing Risks

Potential risks associated with financing the Crenshaw/LAX Project are described in this section. The ability to secure financing will be impacted by a number of potential issues, including:

- Metro's experience in raising debt from municipal tax exempt sources or private financing delivery options will impact the success and timing of the potential financing;
- The timing of the proposed financing may influence the schedule and the Project cost due to unanticipated higher costs of debt at the time of agreed pricing;
- Uncertainty surrounding the future market appetite for municipal tax exempt or private financing structures will impact the cost and timing of debt issuance and repayment; and
- The expected liquidity of the financial markets may be influenced by economic factors such as a lack of sustained economic recovery or capacity constraints caused by an over-demand of projects.

Through its "America Fast Forward" initiative, Metro intends to use a range of federal financing mechanisms, both existing and proposed, to advance and accelerate its delivery of key projects by leveraging Measure R revenues as a source of repayment for federally-subsidized loans. The centerpiece of this initiative is a proposed new class of qualified tax credit bonds, Qualified Transportation Improvement Bonds ("QTIBs"). QTIBs are taxable bonds issued by state, local or other eligible issuers where the Federal government subsidizes most or all of the interest cost through granting investors annual tax credits in lieu of interest. Metro is also utilizing federally subsidized loans available through the TIFIA program, as further described in Section 6.1.3.

QTIBs and TIFIA loan proceeds are projected to lower the overall cost of project financing for Metro's program of transit projects, compared to traditional tax-exempt bond financing; however, it is important to note that the Crenshaw/LAX Transit Corridor does not depend on these leveraging mechanisms to ensure the availability of sufficient Measure R revenues to meet the capital costs of the project during the construction period. This project would likely proceed as scheduled in the adopted 2009 Long Range Transportation Plan even without the creation of QTIBs, as other financing tools remain available. For these same reasons, private financing is unlikely to further enhance the funding profile of the Project.

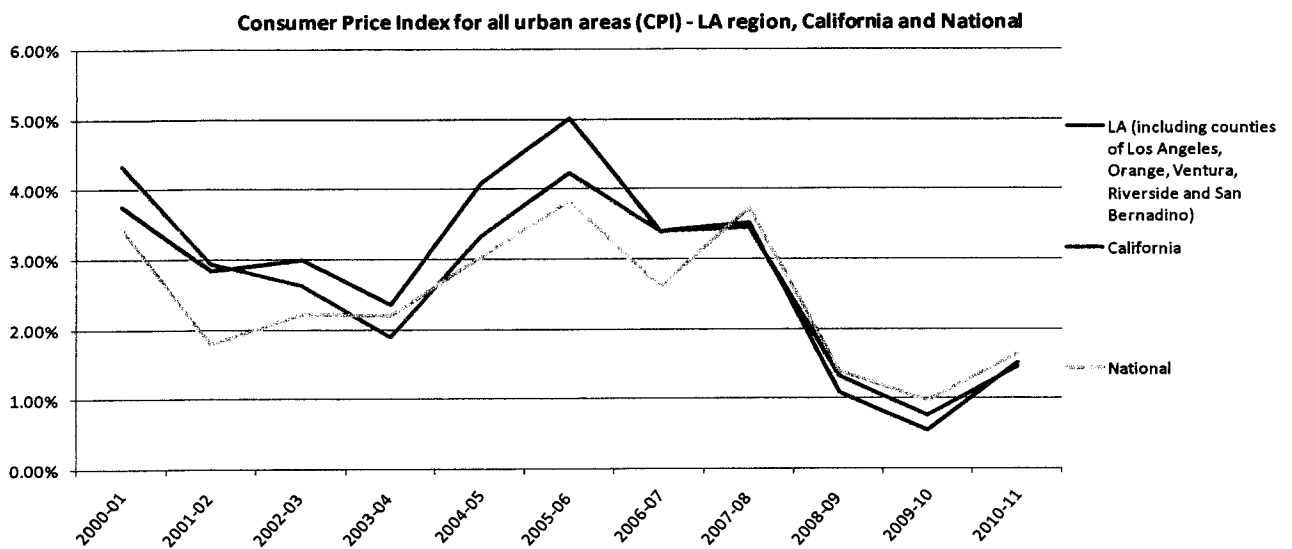
3.3.3. Economic Risks

A key economic risk is the uncertainty surrounding the ability to forecast inflation of costs and revenues over the expected construction timing and operations life of the asset. The cost of inflation is impacted by the timing of the cost and the demand of the underlying commodities and labor associated with the cost component. Therefore, the ability to deliver the Project within the funding plan will be impacted by:

- Any delay to the Project schedule having a direct impact on the construction cost and future cost of operations; as well as
- The broader impact of increases in demand on labor and commodities prices for the region, which may result from a recovering economy and Metro's Measure R program to deliver approximately \$40 billion in projects.

The current forecast construction cost inflation for the Project is 2% for 2011 and 3% from 2012 to 2020.⁴Evidence of the variability of forecasts has been provided below, where data indicate that annual consumer price inflation has ranged between 4.99% and 0.54%⁵ within the last 10 fiscal years.

Figure 4. CPI Index for LA Region, CA and National (source: California Department of Finance)



Overall, the Project faces the risk that an economic recovery combined with the total program demands on commodities and labor will lead to construction and operational costs growing at a faster rate than currently planned by Metro.

⁴Source: Administrative FEIS/FEIR May 2011

⁵California Department of Finance data website

provide routine and capital maintenance for all project components upon completion by the DB contractor(s).

- Option 3 - Design Build Finance Maintain: a single contract for the design, construction, and routine/capital maintenance of all project components over a 35-year period except rolling stock. The Private Partner would also be responsible for providing financing for a portion of the design and construction costs.

4.1. Option 1: Design-Build

The Consultant Team's completion of Task 4 analysis occurred prior to Metro's decision to procure the Project as a single DB contract covering systems, stations, and civil works, with the maintenance facility as a separate DB contract. As originally proposed, the Crenshaw/LAX Transit Corridor Project was to be implemented through three major DB contracts, the first two of which divide up the alignment based on geography into the Harbor Subdivision Segment (Contract No. 1) and the Crenshaw Boulevard Segment (Contract No. 2), as shown in Figure 7 below. They both include civil works components and stations. The Crenshaw Boulevard Segment also includes systems for the entire project. The third contract includes the maintenance yard (Contract No. 3).

Metro intends to use a two-step procurement process to pre-qualify contractors for each of the contracts based on their experience in heavy civil construction, tunneling, track work, systems installation, and construction of yards and shops.

In addition to the DB contracts, Metro will issue other contracts for advance utility relocations and light rail vehicles (LRV).

Metro will also provide routine and capital maintenance for all project components upon completion by the DB contractor(s). These are to be maintained and replaced according to the schedules established by the agency's State of Good Repair (SOGR) capital asset inventory.

The following paragraphs provide a description of the originally-envisioned three DB contracts in greater detail.

Contract No. 1 Harbor Subdivision DB Segment: Includes the work required for the Project's segment that extends from the existing MGL along the Metro's owned Harbor Subdivision to just east of Brynhurst Avenue (a distance of 5.0 miles). The alignment has the following characteristics:

- Aerial guideway from the MGL connection to 111th Street.
- Cut and cover underground configuration from north of 111th Street to north of 104th Street.
- Aerial guideway and station over Century Boulevard.
- At-grade from north of Century Boulevard to south of Manchester Avenue.
- LRT grade separation over Manchester Avenue.
- At-grade from Isis Avenue to east of Hindry Avenue.

- LRT grade separation over La Cienega Boulevard and Interstate 405.
- At-grade from west of N. Oaks Street to west of La Brea Avenue
- LRT underpass at La Brea Avenue.
- At-grade from Market Street to east of Brynhurst Avenue (end of Harbor Subdivision Segment).

In this segment, light rail stations are included in the scope at the following locations: Aviation/Century (aerial station), Florence/La Brea (at-grade station) and Florence/West Boulevard (at-grade station). Surface parking lots are included at the Florence/La Brea Station and the Florence/West Station.

The contract also includes cut and cover construction, BNSF track relocation or removal, light rail trackwork, special trackwork, station platforms, station finishes, demolition, grading, drainage, street modifications, grade crossings, catenary pole foundations and systemwide ductbanks.

Contract No. 2 Crenshaw Boulevard DB Segment: Includes the work required for the Project's segment that extends from east of Brynhurst Avenue in the Harbor Subdivision and turns onto Crenshaw Boulevard to the Exposition LRT Line (a distance of 3.5 miles). The alignment has the following characteristics:

- Cut and cover tunnel box from Victoria Avenue to south of 59th Street.
- At-grade from 59th Street to 48th Street.
- Below-grade cut and cover approach and twin bore tunnels on Crenshaw Boulevard from 48th Street to Exposition Boulevard (end of Crenshaw Boulevard segment).

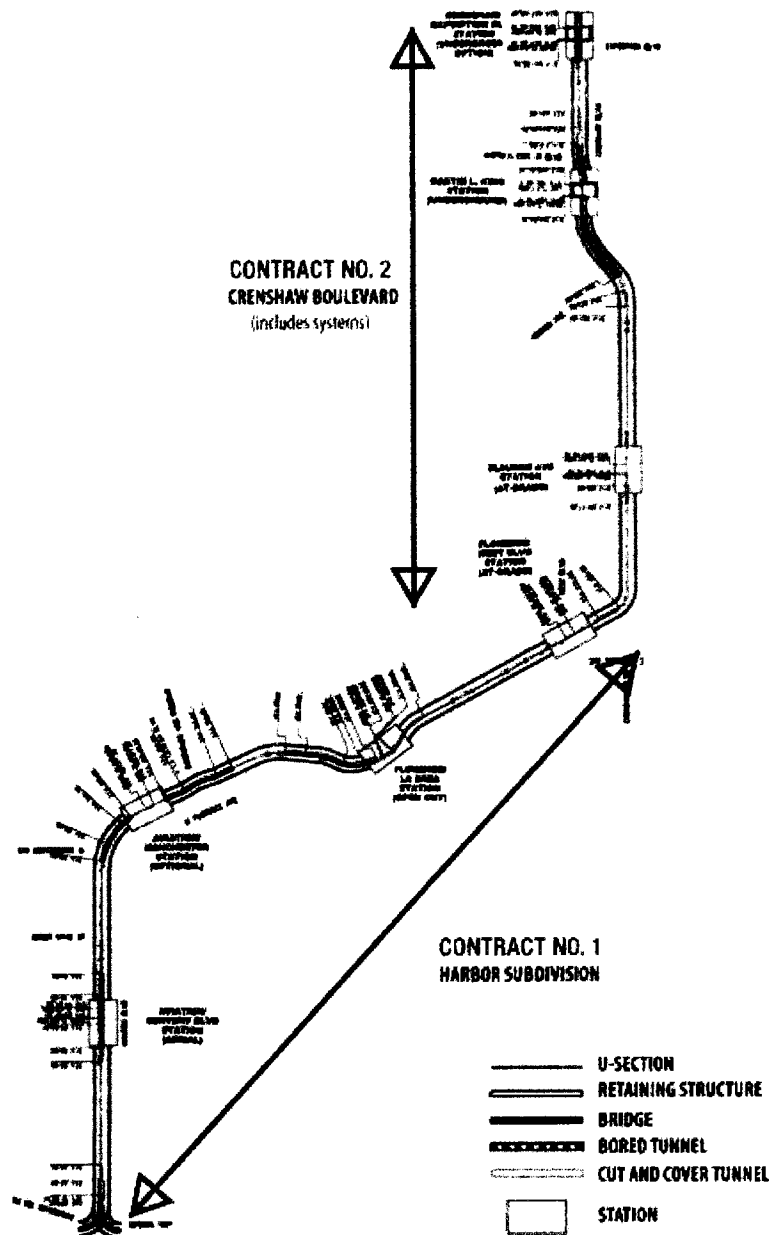
This contract's scope of work includes LRT stations at the following locations: Crenshaw/Slauson (at-grade station), Crenshaw/Martin Luther King (below-grade station), and Crenshaw/Exposition (below-grade station). A surface parking lot is included at the Crenshaw/Exposition Station.

The contract also includes cut and cover construction, twin bore tunnels, light rail trackwork, special trackwork, station platforms, station finishes, demolition, grading, drainage, street modifications, grade crossings, catenary pole foundations, systemwide duct banks, tie-ins to the existing Metro Green Line, and all system installations (for both Harbor Subdivision and Crenshaw Boulevard segments).

Contract No. 3. Maintenance & Storage Facility DB Contract: Includes a full service maintenance and storage facility with heavy repair, service and inspection, wheel truing, car wash, interior cleaning, store inventories, maintenance of way, yard tracks, demolition, grading, drainage, catenary pole foundations, ductbanks and systems installations.

This facility will be used by the existing Metro Green Line, Crenshaw/LAX Transit Corridor, and the planned South Bay Metro Green Line Extension, and Metro Green Line to LAX Extension. The cost of the facility is planned to be shared among the four rail lines.

Figure 5. Crenshaw/LAX Transit Corridor Revised Base Project Delivery Approach



4.2. Option 2. Alternate Design-Build (Alt DB)

Option 2 utilizes Design-Build procurement, but packages the contracts based on function rather than geography, as currently proposed by Metro. This "line of route" approach thus packages construction of all stations along the alignment and communication systems into one contract. All civil works components and the maintenance facility are packaged into a second contract. As under Option 1, Metro

intends to provide routine and capital maintenance for all project components upon completion by the DB contractor(s).

4.3. Option 3. Design-Build-Finance-Maintain (DBFM)

Option 3 includes a single contract for design, construction, and maintenance of all non-rolling stock components over a proposed 35-year period. The length of the concession term is based on recent market precedent for transit P3s in the United States; it is also calibrated to coincide with the maximum loan repayment term of 35 years under the TIFIA program, which would likely form an integral component of any P3 financing strategy. Under the DBFM option, the Private Partner would be responsible for providing financing at the appropriate time for a portion of the design and construction costs. As with both the Base and Alternate DB (Options 1 and 2), Metro would retain responsibility for funding ROW acquisition, advance utility relocations, and light-rail vehicle contracts.

The Private Partner would also be responsible for maintenance of all passenger stations, track, civil works, including tunnels, aerial structures, elevators/escalators, as well as communication systems. The maintenance of garage and shop buildings associated with the Crenshaw/LAX Transit Corridor and MGL known as "Southwestern Maintenance Yard" would not be included in a DBFM contract, as this facility would be shared with Metro employees. The general preference to avoid a potential interface between Metro employees and those hired by the Private Partner accordingly limits the types of non-vehicle maintenance activities that can be performed.

The level of service would be defined in the DBFM contract for preservation of civil works and systems in a state of good repair over the concession period and enforceable via contractually specified penalties and/or withholding of availability payments.

5.0 ANALYSIS OF THE DELIVERY OPTIONS

The delivery options have been analyzed against the key criteria associated with the P3 program goals as defined by Metro staff:

- Optimize risk transfer;
- Achieve a cost effective use of public funds;
- Guarantee timely completion - accelerate project delivery;
- Ensure asset quality throughout the lifecycle; and
- Provide highest quality of service to the traveling public.

5.1. Optimize Risk Transfer

This section explores the potential for each delivery option to optimize the transfer of different types of risk identified earlier in Section 3.0. These include design, construction, maintenance and lifecycle. Optimization of risk transfer supports the goals of Metro's P3 program to the extent that it enables the agency to achieve greater cost and schedule certainty.

5.1.1. Design and Construction Risks

The contract packaging strategy associated with each delivery option represents an important way to transfer and mitigate design and construction risk.

The geographically-based contract packaging strategy for the Base DB approach (Option 1) addresses the technical risks specific to the two different ROW types present in the Crenshaw/LAX Corridor - expected at that time to be an active freight railroad in the south along the Harbor Subdivision and an urban street environment in the north along Crenshaw Boulevard. Separate, geographically-based DB contracts could allow for teams with specific expertise in each segment type to handle the associated risks. (This strategy was proposed prior to the December 2011 Board approval of Metro entering into an agreement with BNSF to abandon freight operations in the Harbor Subdivision.)

For Options 2 and 3, the rationale is that the contract packaging can improve the ability of Metro to integrate components of the project with fewer contracts and with functional integration, particularly since freight operations in the Harbor Subdivision will be abandoned. Interfaces between tunnels, structures, stations and platforms can potentially be managed more efficiently. With fewer contracts Metro is also required to coordinate with fewer parties during the construction phase.

Compared to the Base DB approach (Option 1), the Alternate DB packaging strategy (Option 2) reduces the number of contracts from three to two, with the maintenance yard folded into a larger contract package comprising all civil works components, potentially leading to better risk management and innovation in the execution of the project by both Metro and the contractor. For Metro, the number of contractor

interfaces it must manage is reduced from three to two. For the contractor, the function-based approach to contract packaging proposed in Option 2 allows for the more efficient bundling of similar sitework and construction activities.

For example, under the Alternate DB strategy (Option 2), all cut-and-cover trenching, tunnelling, and removal of the existing freight tracks would be performed under one contract. Together, these activities will create vast amounts of spoils that the contractor will need to transport out of the project area and dispose of. The packaging of all civil works components in one contract in Option 2 allows for the coordinated disposal of spoils created by a variety of construction activities. Particularly as the Crenshaw Boulevard segment and Harbor Subdivision segment have very different levels of access to freeway/rail corridors that could be used to remove spoils from the project area, a coordinated effort in this regard could translate into better risk management during the construction phase.

Given the likely performance bonding requirements to be established by Metro, the further consolidation of multiple contracts into a single contract under the DBFM approach (Option 3) would increase the dollar amount of the overall package and make the bonding requirements financially unsustainable for all but the largest contractors. The DB approaches (Options 1 and 2), by contrast, allow Metro to issue smaller contracts that are more consistent with market capacity for performance bonding. Option 1 carries the additional advantage of enabling Metro to increase local participation and work more closely with the community in individual station areas / segments of the alignment by dividing the project scope geographically between the two main contracts.

5.1.2. Maintenance and Lifecycle Risks

Metro intends to provide routine and capital maintenance under both DB approaches (Options 1 and 2); assets are to be maintained and replaced based on the schedules established by the agency's SOGR capital asset inventory. The risk for the Project under both DB delivery approaches (Options 1 and 2) is that insufficient funding for long-term routine and capital maintenance may not be allocated in some or all years, potentially reducing the quality of service and increasing lifecycle costs above the optimized level that would otherwise be achieved with consistent maintenance expenditures.

The DBFM approach (Option 3) includes responsibility for long-term asset maintenance of the Crenshaw/LAX Transit Corridor; therefore, the risk of performance during the operations phase is passed down to the Private Partner. Metro would be in the position to oversee the performance and to assess payment deductions for contract breaches for any documented performance below agreed-upon standards. In addition, by establishing long-term maintenance standards upfront and committing a portion of the annual availability payment to the future funding of both routine and capital maintenance during the 35-year concession term, the DBFM option establishes long-term budgetary certainty for Metro.

One key issue to explore is whether the limited scope of non-vehicle maintenance transferred to a Private Partner under the DBFM approach is likely to result in significant risk transfer (and thus yield measurable cost savings to Metro) based on the specific

characteristics of the Crenshaw/LAX Transit Corridor. As noted in the project definition, the alignment is comprised of multiple types of construction, including at-grade, aerial and below-grade guideway sections. The associated maintenance activities are thus more specialized and the opportunities for optimizing staffing requirements across several activities by combining those with similar functional expertise more limited. The complexities of this Project would likely require the Private Partner to hire multiple staff positions for relatively short sections of each construction type.

Some savings could potentially be achieved by subcontracting these services to firms that already have a local presence, as opposed to the Private Partner incurring all the necessary start-up and fixed costs required to perform these functions.

However, Metro would still be required to maintain its own separate set of in-house staff specializing in these maintenance activities for its other rail projects, potentially creating some staffing redundancies compared to the Base or Alternate DB delivery (Options 1 and 2). Maintenance activities also include highly specialized skill sets, such as for electric traction power and catenary wiring systems. There is unlikely to be a significant cost differential between Metro and the Private Partner for such highly specialized labor.

Based on the analysis performed to date, it is not known to what extent any savings from reduced labor costs and increased worker productivity under the DBFM option would be offset by other factors, such as start-up costs and management fees. In general, the greater the scale of maintenance responsibilities transferred to the Private Partner, the greater potential there may be for efficiencies of sufficient magnitude to result in overall cost savings to the project sponsor. As discussed further in Section 7.0, a more comprehensive delivery approach inclusive of long-term maintenance responsibilities for the existing MGL may offer the greatest potential to achieve such efficiencies, notwithstanding the other legal and institutional challenges associated with the implementation approach.

5.2. Achieve Cost-Effective Use of Public Funds

Metro has identified cost containment and the cost-effective use of public funds as a major policy consideration in the implementation of its Measure R program. Alternative delivery options may enable Metro to achieve a cost-effective use of public funds by offering greater price certainty over the long term and/or providing opportunities to leverage public funding with private finance options (as outlined further in Section 6.0).

Under the base and Alternate DB approach (Options 1 and 2), Metro is already pursuing a cost-effective project by leveraging Measure R revenues committed to the Crenshaw/LAX Transit Corridor through the federal TIFIA loan program. The flexible loan terms afforded by the TIFIA program allow Metro to draw down the loan proceeds beginning in FY 2016, with the repayment schedule deferred until FY 2021 (after the project's completion).

A DBFM option would enhance the certainty that adequate funding will be available at the appropriate time for design and construction by transferring the risk of financing to the Private Partner.

For financing, a Private Partner could not only utilize the TIFIA program, but increase the leveraging potential of the Project's other funding sources by providing access to additional sources of private finance, such as Private Activity Bonds, bank debt, and equity. These sources would not ordinarily be considered under a wholly publicly-funded project.

The inclusion of private bank debt or equity, while generally available at a higher cost than traditional public financing sources, may on balance lead to a more cost-effective project, as the participation of risk-averse lenders represents an additional layer of managerial oversight who can apply pressure on the contractor to contain costs and deliver a project within budget.

5.3. Guarantee Timely Completion – Accelerate Project Delivery

A key goal of the P3 Program and Metro's "America Fast Forward" initiative is to accelerate delivery of Measure R transit projects. The priority given to the goal of project acceleration is particularly critical for the Crenshaw/LAX Transit Corridor, given its status as the first project to be delivered under "America Fast Forward."

Assuming that these timing-related issues could be resolved, the DBFM approach (Option 3) presents potential project delivery advantages compared to the Base and Alternate DB options insofar as an availability payment-based DBFM concession creates a stronger incentive for the contractor to complete the construction on schedule, both as a result of payments being deferred to the end of construction and the investment of private equity in the project or "skin in the game." From this standpoint, DBFM could be conducive to Metro's goal of timely project completion.

5.4. Ensure Asset Quality Throughout Lifecycle

Neither DB approach (Options 1 and 2) includes a lifecycle component in the contractual scope. Responsibility for maintaining and monitoring asset performance would be retained by Metro upon completion of the project by the contractor. All assets would be maintained under Metro's State of Good Repair initiative in collaboration with FTA to track the condition and project future replacement dates for the entire capital asset inventory. Funding for this purpose is programmed separately based on available sources at the time of replacement.

Under a DBFM approach, asset performance becomes the responsibility of the Private Partner, and a portion of the availability payment is typically reserved for routine maintenance and lifecycle needs. The Private Partner is generally evaluated based on the performance of the asset, rather than adherence to a specific replacement schedule. Performance must therefore be measurable in order for Metro to enforce the terms of the contract. The separation or "ringfencing" of any privately-maintained functions from the Metro's existing systems is advisable for performance monitoring purposes.

The DBFM option (Option 3) creates a number of interfaces with Metro's existing systems along the alignment that may make performance monitoring more challenging. One

key concern pertains to existing Metro rail facilities and whether there is sufficient space to isolate any privately-maintained signaling and communications equipment such that the Project is adequately separate from the rest of Metro rail system.

5.5. Provide Highest Quality of Service for the Traveling Public

Metro is to retain responsibility for transit operations on the Crenshaw/LAX Transit Corridor under all three options, and for maintenance under the Base and Alternate DB approaches (Options 1 and 2).

Over the long term, the proper maintenance of assets in a state of good repair is essential to providing high-quality service for the traveling public. To the extent that funding is identified and committed for this purpose via the availability payment structure under a DBFM contract, this option may provide for more consistent expenditures on maintenance and thus a more consistent quality of service.

Conversely, service quality may be negatively impacted if risks associated with ongoing and capital maintenance under a DBFM concession (Option 3) are not thoroughly addressed in the contract between Metro and the Private Partner. For example, a poorly defined performance regime may result in ongoing disputes over responsibility for system repairs. The proper “ringfencing” of the asset is again critical to ensure that any deviation in service quality from agreed-upon performance standards can be properly attributed to the responsible party.

5.6. Summary of Options Analysis Results

Table 7 below summarizes the results of the delivery options analysis above using a “dot” system to indicate on a qualitative basis whether a given option would be suboptimal (●), neutral(O) or optimal (●) in satisfying a particular evaluation criterion. The ratings for each option have also been combined into an overall score.

This qualitative exercise allowed for an overall comparison of the delivery options and assisted the Team in assessing whether a particular project delivery option would provide greater potential to meet Metro’s goals.

Based on the P3 program goals articulated by Metro and the technical assessment performed by the Consultant Team, both DB approaches (Options 1 and 2) and the DBFM approach (Option 3) present unique advantages that make each of them viable delivery option for the Crenshaw/LAX Transit Corridor:

- With its geography-based contract packaging approach, the Base DB option (Option 1), which assumed continuation of active freight rail service in the Harbor Subdivision, attempts to reduce construction risk associated with the different ROW characteristics in the Crenshaw/LAX Corridor by assigning responsibility for each segment type to the team specializing in the management of those risks;
- With its concentration of all systems work and all civil work into two functionally-based contracts, the Alternate DB option (Option 2) provides opportunities for

better logistical coordination of similar construction activities, potentially resulting in greater efficiencies;

Table 7. Comparison of Project Delivery Options Relative to Metro Goals

| Goals | Evaluation Criteria | Base Option 1: DB | Option 2: Alt DB | Option 3: DBFM |
|---|--|-------------------|------------------|----------------|
| Optimize risk transfer | Transparency/availability of information for private sector to price risks and submit "fixed price" bid | ○ | ○ | ● |
| | Flexibility of the proposed project to enable innovation | ● | ○ | ● |
| | Compatibility of procurement method with regulatory requirements (Buy America/labor law/local hire/alternative fuel/green construction policies, etc.) | ● | ● | ○ |
| | Ability of private sector to comply with insurance requirements (potential capacity issue) | ● | ● | ○ |
| Achieve a cost-effective use of public funds | Price certainty to Metro | ○ | ● | ● |
| | Certainty and quantum of project funding streams, both short and long term | ○ | ○ | ○ |
| | Maximum leveraging of public funds through greater access to alternative sources of finance | ○ | ○ | ● |
| Timing - Accelerate project delivery | Ability to guarantee schedule certainty | ● | ● | ● |
| | Potential to accelerate project delivery | ○ | ○ | ● |
| Ensure asset quality throughout lifecycle | Ability to measure/monitor contractor performance/output on lifecycle | ○ | ○ | ● |
| Provide highest-quality service for the traveling public | Ability to achieve operational performance/quality and safety for the traveling public | ○ | ○ | ○ |
| LEGEND | suboptimal <<< neutral >>> optimal | | | |
| | ● ○ ● | | | |

- The elements to be maintained under the DBFM option (Option 3) share an interface with the existing Metro Green Line. For Metro to succeed in securing a private entity willing to accept the associated risk, this interface would have to be sufficiently “ringfenced” for performance monitoring purposes. Assuming this could be accomplished, the availability payment-based structure of the DBFM option could provide financial incentives for the Private Partner to maintain quality service performance over the long term;
- The contract packages for both DB options are sized consistent with market capacity for performance bonding requirements;
- Compared to DB Options 1 and 2, a single DBFM contract associated with Option 3 would further reduce Metro’s interfaces with multiple contractors, while the larger size of this contract would likely still be accommodated by the surety markets;
- A DBFM option could allow Metro to tap private sources of financing, mitigating the risks of any near- or medium-term challenges associated with specific project funding sources. Offsetting this conceptual advantage of DBFM is that with either DB option, Metro has access to Measure R funding within the first ten years and will be leveraging Measure R revenues through the TIFIA program. In addition, Metro may have access to other innovative financing mechanisms, depending on the outcome of pending legislation at the federal level; and
- In terms of schedule, lenders could apply additional pressure on the Private Partner to deliver the project on time, while the development of detailed performance specifications may at the same time lengthen Metro’s existing procurement process.

Section 6.0 describes some of the private finance options that could be used in a DBFM concession.

6.0 POTENTIAL P3 FINANCING STRATEGY

If Metro were to adopt a delivery option such as DBFM that included financing responsibilities, several sources of private finance could potentially be available, including bank loans, Private Activity Bonds, TIFIA, and private equity. These are discussed below:

6.1. Options for Private Financing

6.1.1. Bank Debt

Due to the dominance of tax-exempt financing in the US, the use of bank debt in US P3 transportation projects has been limited. In December 2010, the Long Beach Court Building, a social infrastructure P3 deal, reached financial close using a short term bank loan and a year prior to that Port of Miami Tunnel reached financial close using a bank facility of \$342 million combined with TIFIA finance of \$341 million. Currently, shorter tenors on bank debt mean that this form of capital carries a greater refinancing risk than a bond. However, it does have the advantages that proceeds are drawn periodically, as required, avoiding “negative carry” interest costs, and the process for reaching financial close is simpler and can be done concurrently with commercial close. But it is important to note that bank debt may be limited in its availability in the short term due in part to the European debt crisis which could restrict the amount of finance that could be raised for a project of this scale.

6.1.2. Private Activity Bonds (PABs)

PABs are tax-exempt bonds issued through a conduit established by a state or local government agency for the purpose of funding eligible expenditures, the proceeds of which may be used by one or more private entities for a qualified project. At this time the United States Department of Transportation (USDOT) is reporting issued and/or approved PAB allocations of \$8.0 billion, out of legal maximum of \$15 billion. Recently, Presidio Parkway in Northern California received an allocation of \$592 million (financial close expected in Spring 2012) and the Eagle P3 transit project in Denver, Colorado reached financial close on \$397 million in PABs debt in August 2010. PABs offer an all-in cost of bond debt that can be less expensive than bank debt, as well as a long-dated solution that removes refinancing risk for the private developer. The use of a PAB issue does include several constraints including: the requirement to meet federal standards; expenditure of 95% of funds within 5 years; restriction on use of PABs proceeds to fund existing assets; and the need to comply with arbitrage rules on invested funds.

6.1.3. Transportation Infrastructure Financing Innovation Act (TIFIA)

As part of the FY 2010 Transportation Investment Generating Economic Recovery (TIGER) II program funded by the American Reinvestment and Recovery Act (ARRA), the Crenshaw / LAX Transit Corridor Project was awarded a \$20 million USDOT grant that will subsidize a \$545.9 million TIFIA loan to Metro in support of the Project’s capital costs. As described below, TIFIA can also be utilized in coordination with private financing.

The TIFIA program is designed to fill market gaps and leverage substantial private and other non-federal co-investment by providing supplemental and subordinate capital to projects. The TIFIA program offers project sponsors the following advantages:

- Long-term loans at the comparable U.S. Treasury yield (State and Local Government Series (SLGS) rate plus one basis point) – 3.14% for a 35 year loan as of January 26 , 2012;
- Ability to lock in the interest rate several years in advance of a drawdown, without any additional cost;
- Right to prepay loan draw downs in whole or in part at any time, without penalty;
- Potential willingness of USDOT to accept more flexible terms, such as back-loading debt service to reflect anticipated growth in the pledged revenue stream, and thinner debt service coverage margins than otherwise required to obtain an investment-grade rating in the capital markets;
- Diversified source of debt capital (U.S. Treasury as lender), reducing market saturation; and
- Lower transaction costs.

The USDOT awards credit assistance for transportation projects to eligible applicants, which include state departments of transportation, transit operators, special authorities, local governments and private entities. The challenges associated with TIFIA assistance are summarized below:

- Demand exceeds funding supply, therefore applications are on a competitive basis;
- Availability of funds are subject to Congressional appropriation and may therefore impact project schedule;
- Funds permitted are limited to 33% of eligible project costs;
- An investment grade rating is required for facilities senior to the TIFIA loan; and
- The TIFIA office requires the loan to carry a 'springing' lien in the event of bankruptcy such that TIFIA debt ranks paripassu with senior.

6.1.4. Private Equity

Sources of private equity include financial institutions, pension funds, private developers and infrastructure funds. Equity providers typically provide the smaller share of funding, as compared to debt, for example the Eagle P3 equity component was \$54 million, against \$397 million in debt (or a 14% debt to equity ratio). Equity providers are paid a return after project costs, debt service and any taxation costs have been paid. As a result, returns to equity providers are varied and due to this increased risk of repayment, providers of equity require a higher cost of funds.

6.2. Potential Availability Payment Structure

If the Crenshaw / LAX Transit Corridor Project were delivered utilizing an alternate procurement approach that includes either long-term maintenance responsibilities or the use of private finance, such as DBFM (Option 3), the Consultant team assumed that the Private Partner would be compensated under an availability payment model, with all fare revenues continuing to accrue to Metro.

Under such a model, Metro would make periodic payments to the P3 partner, the base amount of which would be bid during the procurement phase. These availability payments are typically structured to repay the cost of debt, to provide a return on invested capital, and to cover the projected cost of contractually required maintenance, lifecycle maintenance, and any included operating costs over a specified contractual period. In some cases, payments may begin during the construction period to cover part of the capital costs as well. Generally, the part of the availability payment related to financing is fixed, and the portion covering maintenance and operation (if applicable) is subject to escalation based on an agreed-upon index.

Payments received by the Private Partner would include:

- A milestone payment at substantial completion of the work planned to be completed once the facility is available for revenue service; and
- Availability payments over a 35-year maintenance period, subject to performance.

In its Task 3 report, the Consultant Team proposed a potential availability payment structure for the Crenshaw/LAX Transit Corridor, with Measure R funding assumed to meet 70% of construction costs based on similar levels of public funding support for transit projects in the US. The other 30% consisted of private bank debt and an equity contribution by the Private Partner to be repaid over a 35-year period via annual availability payments using the remainder of Measure R and other funding sources not expended during the construction period.

This financing structure ensures that the Private Partner's equity stake has a long-term exposure through the maintenance period. This exposure in turn helps to maintain rigorous standards of performance, with the equity investor penalized in the form of reduced availability payments if performance falls below contractually agreed-upon standards.

The equity investor would also have exposure through life-cycle expenditure if increased capital replacement programs are required earlier in the asset life due to lack of routine maintenance or poor construction quality.

6.3. Constraints on Metro Funding Sources Comprising an Availability Payment

The revenue streams currently available to fund a long-term availability payment on the Crenshaw/LAX Transit Corridor are limited to a mix of one-time and ongoing federal, state, and local funding sources, most notably Measure R, which is scheduled to sunset in FY 2039. The 35-year DBFM concession considered in this business plan would end in FY 2047, and thus exceeds by eight years the expiration date of Measure R. Hence, Metro's ability to accommodate a long-term financial commitment to a Private Partner may be constrained in part by the sunset of this important revenue source unless there is an extension to the expiration date or other revenue sources are identified.

The Consultant team analyzed the potential long-term availability payment funding options for the Crenshaw/LAX Transit Corridor in collaboration with the staff of Metro's Capital Planning and Finance Departments. In contrast to Measure R, Proposition A and Proposition C do not sunset and could be theoretically used to fund the portion of the availability payment attributable to the cost of maintaining the non-underground segments of the project without running afoul of the use restrictions imposed on Proposition A and C funds by the Metro Reform and Accountability Act of 1998.

Assuming that this restriction remains unchanged, approximately 20% of the 8.5-mile project consisting of tunnels or cut-and-cover trenches would be ineligible for Proposition A and C funds. This portion of the project would need to be covered by other Metro revenue sources after FY 2039.

Other potential revenue sources, such as ground lease payments from future joint development agreements or advertising, are likely to be considered either highly speculative or insufficiently creditworthy by the financial markets to guarantee availability payments.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This analysis identifies several possible opportunities and challenges associated with delivering the Crenshaw / LAX Transit Corridor Project using Design Build and Design Build Finance Maintain options relative to achievement of Metro's P3 program goals. Based on this analysis and input received from Metro staff, the Team recommends the Alternate DB approach (Option 2) for delivery of the Project. The function-based contract packaging associated with this approach reflects an optimal risk management strategy for Metro, with freight operations by BNSF to be abandoned along the Harbor Subdivision, which comprises the southern segment of the Project. The geographically-based DB Option (Option 1) was proposed by Metro as an approach to address unique design and operational issues associated with LRT operation in what was then expected to be an active freight corridor.

While the decision to abandon freight service on the Harbor Subdivision is a consideration in selection of a project delivery approach, abandonment also serves to mitigate key construction and operational risks associated with a shared ROW scenario, including technical, liability and insurance risks surrounding the design and construction of elements such as grade separations, intrusion fences, grade crossings, and drainage facilities. In addition, curtailment of active freight operation removes FRA requirements otherwise applicable to a shared use corridor.

With negotiations between Metro and BNSF now resulting in the abandonment of freight rail operations, the right-of-way characteristics along the Harbor Subdivision and the northern segment of the Corridor become more similar. The design and construction risks associated with the Harbor Subdivision are reduced. As a result, corridor-wide responsibility for the completion of trackwork and systems can be more easily assigned to a single DB contractor, as proposed under Option 2.

The potential for efficiencies extends to other project elements as well. The ability to bundle similar construction activities and sitework in Option 2 has the potential to yield additional economies of scale compared to the Base DB option. For example, construction of civil works, such as tunnels and trenches, can be bundled into one contract, rather than having these same construction activities performed under the major DB contract work, as was originally proposed under the Base DB approach (Option 1). Similarly, the coordination of station design and construction under one contractor may result not only in greater bulk purchasing power for materials, but in a more consistent visual identity for the corridor, while still allowing for local neighborhood character to be reflected in individual station design.

While an alternate DB contract packaging strategy as proposed in Option 2 can yield cost efficiencies, such efficiencies are likely to be more limited in overall percentage terms than those already achieved by Metro's change in procurement approach from DBB to DB. The key benefits of Option 2 lie primarily in reducing the number of contracts managed by Metro from three to two and offering a greater opportunity for each contractor to innovate in the delivery of Project elements across the corridor. Such innovation may result in greater cost containment if not a lower overall cost for Metro.

With respect to the Southwestern Maintenance Yard, the implementation schedule for the Crenshaw/LAX Transit Corridor calls for the maintenance facility to be procured separately nearly a year later than the alignment contracts (Contracts No. 1 and No.2). This is due primarily to unanticipated delays experienced in the environmental review process for the maintenance facility and consequently its readiness to be put out to bid. That said, both the major DBcontract work and the maintenance facility are anticipated to start construction at approximately the same time, in mid-2013. The recommendation of Option 2 assumes that Metro is able to align the procurement schedules and include the maintenance facility in a larger DB package comprised of the civil works components.

In addition to the two DB options considered in this analysis, DBFM was also evaluated as a third potential option. While a DBFM concession (Option 3) also ranks highly in this analysis and has potential to satisfy some of Metro's P3 program goals and criteria, the advantages do not merit recommendation of this procurement approach, for the following reasons:

- **Cost savings already captured by the change from Design-Bid-Build to a Design-Build procurement approach.** As noted earlier, Metro has already taken advantage of a primary driver of cost savings during the design and construction phase of the Project by selecting Design-Build as its procurement approach.
- **Non-vehicle maintenance component too limited to result in major efficiencies.** Based on Metro's historical LRT O&M cost experience as reported to the National Transit Database, any additional cost savings to be achieved through the transfer of risk associated with a DBFM concession are likely to be limited, as the non-vehicle maintenance costs included in the concession would comprise less than 10% of total O&M costs for the Project. The transfer of limited maintenance responsibilities to the private sector provides similarly limited opportunities for efficiencies and economies of scale.
- **Suboptimal risk transfer achievable under Design-Build-Finance-Maintain based on existing project definition and characteristics:**
 - **Project components insufficiently "ringfenced" from rest of Metro rail system.** The current operating scenarios propose to split service at the Aviation interlocking with Metro vehicles proposed to operate on what would be privately maintained track along the Crenshaw/LAX Transit Corridor. This interface with the existing Metro Gold Line makes it more difficult for Metro to "ringfence" a privately-maintained asset and monitor the Private Partner's performance. This will be further exacerbated upon extension of the Green Line to South Bay and LAX Airport, as these other lines will traverse the Crenshaw/LAX Transit Corridor to access the Southwestern Maintenance Yard and would likely be operated as through-routed service. The outcome of such lack of ringfencing may be ongoing disputes over responsibility for potentially diminished service quality.
 - **Difficult to tie availability payment to performance monitoring due to lack of ringfencing.** Without a more comprehensive degree of control over the system, including operations and maintenance of rolling stock components,

Metro may find it more difficult to shift risk to the private sector. In addition, a potential Private Partner may be less willing to accept the risk associated with a long term availability payment-based contract.

- **Private financing unlikely to further enhance project funding profile.** In light of Metro's funding availability and schedule and its ability to access low-cost financing, there is limited potential for private financing to mitigate the funding risk associated with the Project. The Crenshaw/LAX Transit Corridor benefits from a strong local contribution in the form of Measure R, and the timing of those funds is already well matched to the construction cost curve. Metro currently has access to lower-cost financing through the TIFIA program and may also benefit from the use of interest-subsidized debt in the form of proposed Qualified Transportation Improvement Bonds.
- **Need to address challenges associated with sources of funding for availability payments.** With regard to funding and financing, there are challenges associated with the use of availability payments for the Crenshaw/LAX Transit Corridor and Metro transit projects in general that Metro would need to address prior to the implementation of a DBFM contract, including:
 - Limitations on Metro's ability to enter into long-term concession agreements due to the sunset of Measure R in FY 2039;
 - Restrictions on the use of Proposition A and Proposition C funds for transit projects with an underground component.

Consideration of a Comprehensive DBFOM Option

Building upon the findings of the assessment of alternative project delivery options, the Consultant Team continues to view a comprehensive DBFOM option as having high potential for cost savings to Metro over the long term. Such an option would require broadening the Project scope to include the rolling stock and non-vehicle maintenance components as well as operations of the existing MGL and Crenshaw/LAX Transit Corridor.

Expansion of the Project scope to include a broader spectrum of O&M as well as other related LRT lines would address some of the deficiencies associated with a DBFM approach (Option 3) identified above. Specifically, it would address the "ringfencing" issues and the scale of risk transfer achievable for Metro. Indeed, a more comprehensive transfer of maintenance and lifecycle responsibilities under a comprehensive DBFOM approach would allow for any fixed and managerial costs incurred by the Private Partner during the ramp-up phase of operations to be spread out over a larger system and length of track. As such, it may offer greater opportunity and incentives for the developer to realize efficiencies and economies of scale, leading to measurable long-term cost savings for Metro compared to the Base or Alternate DB approaches (Options 1 and 2).

In comparison to DBFM Option 3, a comprehensive DBFOM including the existing Metro Green Line presents an optimal scenario with respect to the monitoring of asset performance, as many of the system interfaces between Metro and the developer are

eliminated or otherwise mitigated. Co-joining the lines would create one continuous system to maintain, with greater ease of oversight for Metro in terms of contract management. It would also allow for potential expansion of the concession scope over time as new Green Line extensions to LAX Airport and the South Bay are added.

Metro might also potentially benefit from equipment upgrades that the developer would elect to perform on the existing MGL sooner than they would otherwise be implemented under Metro's replacement schedule. Such upgrades could potentially result in improved service reliability for passengers and in lower lifecycle costs for Metro. Signaling technology, for example, has changed rapidly in the past ten to fifteen years since construction of the MGL, with solid state signaling systems now replaced by modern computer-based signaling. The developer might choose to re-signal the existing MGL with the newer technology to remove any operational interface or incompatibility with the Crenshaw/LAX Transit Corridor. This type of upgrade would provide for much more efficient operations and probably greater capacity on the network.

In its recent February 2010 State of Good Repair (SOGR) Assessment, for example, Metro inventoried the known capital maintenance needs for the MGL and identified a number of elements, including wayside systems, elevators, communications and signaling equipment that would need to be replaced over the proposed 35-year concession period. A more thorough SOGR assessment would need to be performed and made available during the procurement process in order for bidders to appropriately price in the costs of needed improvements and/or upgrades on the MGL.

If Metro were to consider a comprehensive DBFOM at this stage of project development, potential impacts on the current procurement schedule would need to be taken into account. Development of performance specifications for the Project and for the existing MGL as well the re-negotiation of existing labor contracts would both likely lengthen the amount of time needed to procure the project beyond the timeline associated with the current two-step RFQ/RFP process, in which Metro plans to award the two main DB contracts by early 2013.

In addition, the Consultant Team identified a number of additional technical, institutional and regulatory issues associated with the transfer of existing MGL operations to a Private Partner, including:

- Location of the Southwestern Maintenance Yard, which would require vehicles for future Green Line extensions to LAX Airport and the South Bay to operate on track maintained by the Private Partner, thereby potentially creating the issue of a shared interface, assuming that Metro were to operate and/or maintain those extensions;
- Potential effect on the competitive bidding environment for future Green Line extensions if a Private Partner had been previously selected to operate and maintain the existing MGL and Crenshaw/LAX Transit Corridor;
- Lack of institutional precedent for utilizing the provisions of the Transit Design-Build Law (Public Contract Code 20209.5) to implement a comprehensive DBFOM; and

- Section 5333(b) of the Federal Transit law requiring that arrangements be made to protect certain rights of mass transit employees affected by grants of Federal funds for the acquisition, improvement, or operation of a transit system.

The resolution of these issues would further lengthen the procurement process. On this basis, the timeline associated with implementation of a comprehensive DBFOM option for the Crenshaw/LAX Transit Corridor and existing MGL may be inconsistent with Metro's goal of Project acceleration under the "America Fast Forward" initiative. The special status of the Project as the first to be built under this initiative lends greater weight in this analysis to schedule considerations over the potential long-term cost savings and risk transfer under a comprehensive DBFOM concession. Such trade-offs support the recommendation from this analysis to modify Metro's proposed packaging strategy within the parameters of a DB procurement approach, so as to maximize potential cost efficiencies without adversely affecting the Project schedule.