

ATTACHMENT E

**LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY**

Public-Private Partnership Program

Regional Connector Business Plan

Prepared by
INFRACONSULTLLC

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

FINAL
January 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	5
1.1. Description of Project Scope	5
1.2. Summary of Project Construction Costs and Schedule	7
1.3. Summary of Operations and Maintenance Costs	8
1.4. Summary of Implementation Schedule.....	9
1.5. Summary of Project Funding Sources	9
1.6. Environmental Impact and Process	11
2.0 Evaluation approach	12
2.1. Objectives of the Business Plan.....	12
2.2. Program Goals	13
2.3. Approach for Evaluation of Alternative Delivery Options	15
3.0 Project Risks	16
3.1. Summary of Key Project Risks	16
3.2. Operations Phase Risks.....	18
3.3. Funding Risks.....	19
3.3.1. FTA New Starts	20
3.3.2. High-Speed Rail Bonds (Proposition 1A)	20
3.3.3. Proposition 1B	20
3.3.4. Measure R.....	20
3.4. Economic Risks	22
4.0 P3 Procurement options analysis	24
4.1. Summary of the Design-Build Option.....	24
4.2. Summary of the Design-Build-Finance-Maintain Option.....	24
4.3. Analysis of the Options.....	25
4.3.1. Optimize Risk Transfer	25
4.3.2. Achieve a Cost Effective Use of Public Funds	27

4.3.3. Ensure Asset Quality Throughout the Asset Lifecycle	28
4.3.4. Accelerate Project Delivery	28
4.3.5. Provide Highest-Quality Service for the Traveling Public	29
4.4. Results of Options Analysis	29
5.0 P3 financing Options	32
5.1. Summary of Sources for the Proposed P3 Option	32
5.1.1. Options for Private Finance	32
5.1.2. Recent Precedent P3 Transactions	35
6.0 Conclusions.....	36

List of Figures

Figure 1: Regional Transportation Projects	5
Figure 2: Construction Cost Profile, Excluding Vehicle Costs	8
Figure 3: Metro Forecasting: Regional Connector (Aug 2010)	10
Figure 4: Sales Tax Receipts for Prop A and C	21
Figure 5: CPI Index for LA Region, CA, and National	22
Figure 6: Major Sources of Funds for Transportation P3 Deals 2007 – 2010	33

List of Tables

Table 1: Delivery Options Considered	2
Table 2: Construction Cost Breakdown	7
Table 3: Project Timeline	9
Table 4: Metro Funding Plan	9
Table 5: Metro P3 Program Goals and Example Evaluation Criteria.....	14
Table 6: Results of Options Analysis	30

EXECUTIVE SUMMARY

Objective

The objective of this business plan is to develop and analyze a range of possible delivery options for the Regional Connector project (Project) and to determine what, if any, role there might be for private participation in the design, construction, financing, and/or maintenance of the Project or of particular project components.

Project Description

The Project will form a crucial link in Los Angeles County Metropolitan Transportation Authority's ("Metro") transit network comprising a 1.9 mile direct light rail link between the Metro Gold Line and the Metro Blue Line and Metro Expo Line terminus, located in downtown Los Angeles. The current plan, documented in the Administrative FEIR/FEIS (May 2011), includes the development of a double track tunnel and three stations along the alignment using a combination of tunnel boring and cut and cover techniques. It is expected that the operations and maintenance for the new section will be folded into existing Metro activities and included as subcomponents of its existing north-south and east-west routes.

The total Project capital cost is approximately \$1.367 billion in year of expenditure dollars, including the cost of rolling stock. The planned funding for the project includes \$160 million of Measure R funding and \$819 million of FTA New Starts funding. It is expected that the majority of the remaining costs will be met from State funding sources, including proceeds from High Speed Rail Bonds and Proposition 1B dollars.

The Project is currently in the preliminary engineering and environmental approval stage of development. The Record of Decision is anticipated in Winter 2012. The administrative draft of the final environmental impact statement/report was submitted to the FTA on June 27, 2011.

This Project is included as one of the 12 designated by Metro and the City of Los Angeles as part of its 30/10 plan, which seeks to use innovative finance and delivery options to advance project delivery faster than would be achievable under conventional options. It was approved by the voters of Los Angeles County as eligible for receipt of Measure R funds authorized by the 2008 referendum.

The Project is one of 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.

Risk Assessment

The project faces several risks in its delivery. Among the most significant are cost overruns on construction, primarily due to geotechnical unknowns and the complexity of tunneling in an urban environment, inflation due to commodity price changes and impacts on the labor market of delivering the Measure R program, and delay in securing New Starts funding and other planned funding.

Risks such as those summarized above may act to increase the cost of the Project and/or delay the date of completion. In addition, there are uncertainties in the cost of future maintenance, repair and replacement of tunnel infrastructure, station equipment, signals, track and systems. The risks identified above may be mitigated, transferred or shared by Metro's implementation strategy.

Delivery Options Considered

Two delivery options are considered in this business plan, a Design-Build ("DB") and a Design-Build-Finance-Maintain ("DBFM"), as shown below:

Table 1: Delivery Options Considered

DB option	DBFM option
<p>Structured as either one or two Design-Build contracts covering: Tunnels (includes stations and structural box excavation), design and delivery of the TBM following Metro performance specifications; and other items including stations, track work, systems and systems integration testing.</p>	<p>A single Design-Build-Finance-Maintain (DBFM) contract for design and construction of 3 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 the tunnel lining to underside of rail, stations and stations fixtures, escalators, elevators and other civil components.</p>
<p>Funding and financing for the project would be as planned in Metro's 30/10 forecast model. Legislation is pending to create a new class of tax credit bond, Qualified Transportation Bonds ("QTIBs") which would potentially lower the overall cost of project financing to Metro. The intent is to use Measure R funds to raise the necessary level of QTIBs to finance capital expenditure.</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 5 of this business plan.</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) ▪ Develop performance specifications for the Tunnel Boring Machine (TBM) 	<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)

DB option	DBFM option
<ul style="list-style-type: none"> ▪ Acquisition of right of way (ROW) ▪ Utilities relocation ▪ Vehicle procurement ▪ Construction and operations of the Operations Center ▪ Rail operations and maintenance ▪ Routine and capital maintenance 	<ul style="list-style-type: none"> ▪ Acquisition of right of way (ROW) ▪ Utilities relocation ▪ Vehicle procurement ▪ Construction and operations of the Operations Center ▪ Rail operations and maintenance

Under a proposed DBFM approach a component of the project capital cost would be paid for by private finance, to be repaid over the life of the contract term (usually 20-35 years) in the form of an availability payment. The availability payment would be paid over time using allocated Metro funds (such as Measure R sales tax revenues).

Private finance sources may include bank debt, private activity bonds, federal credit assistance authorized by the Transportation Infrastructure Financing Innovation Act (TIFIA) and private equity.

Analysis and Results

This business plan seeks to provide a qualitative assessment of selected Project delivery options originally discussed with Metro during Task 3 and throughout this Task 4. The analysis assesses a Design-Build ("DB") option and a Design-Build-Finance-Maintain ("DBFM") option based on Metro's objectives for the Measure R program. These objectives have been summarized as:

- Achieve most cost effective use of public funds.
- Accelerate project delivery.
- Optimize risk transfer.
- Ensure asset quality throughout the lifecycle.
- Provide highest-quality service for the traveling public.

Based on the scope of the Project and Metro's objectives for the Measure R program, two key attributes have been identified which drive the analysis:

- The Project scale: The short length and relatively small amount of civil works construction of the Project make an associated maintenance contract relatively unattractive and costly, given the high amount of overhead such a small contract would have to bear. This "diseconomy" of scale does not appear to be balanced against other economies that could result from transferring maintenance to a private contractor.

- **Interface risk:** The interface risks for the maintenance of the Project would likely be increased under a private delivery option as the developer would have to interface with existing line components running north-south and east-west, putting not just the Project at risk but the entire central section of the Metro system if outages occurred or reliability issues surfaced.

Overall, based on the limited scope for the project and its crucial location, a Design-Build approach for the Project under which ongoing maintenance and operations are included within the future major line operations by Metro appears to be the most suitable approach. Under this approach, Metro can benefit from risk transfer afforded by combining design and construction into a single contract, minimizing interface risk and scheduling delays and allowing for increased innovation in construction means and methods. By retaining the operations and maintenance within Metro, Metro will achieve the benefits of system integration and economies of scale, given the function of the Project as a connector between two much larger lines and the small physical scale of the civil work.

Private financing options also appear to be infeasible given that one of the primary sources of repayment for any project investment, the FTA New Starts program, has not yet committed to either the amount or timing of the grants sought by Metro for the Project. The heavy reliance on New Starts funding exposes the Project to significant risks in schedule and cost if funds are not received as they are currently programmed. This is a risk that a developer would not accept.

1.0 PROJECT DEFINITION

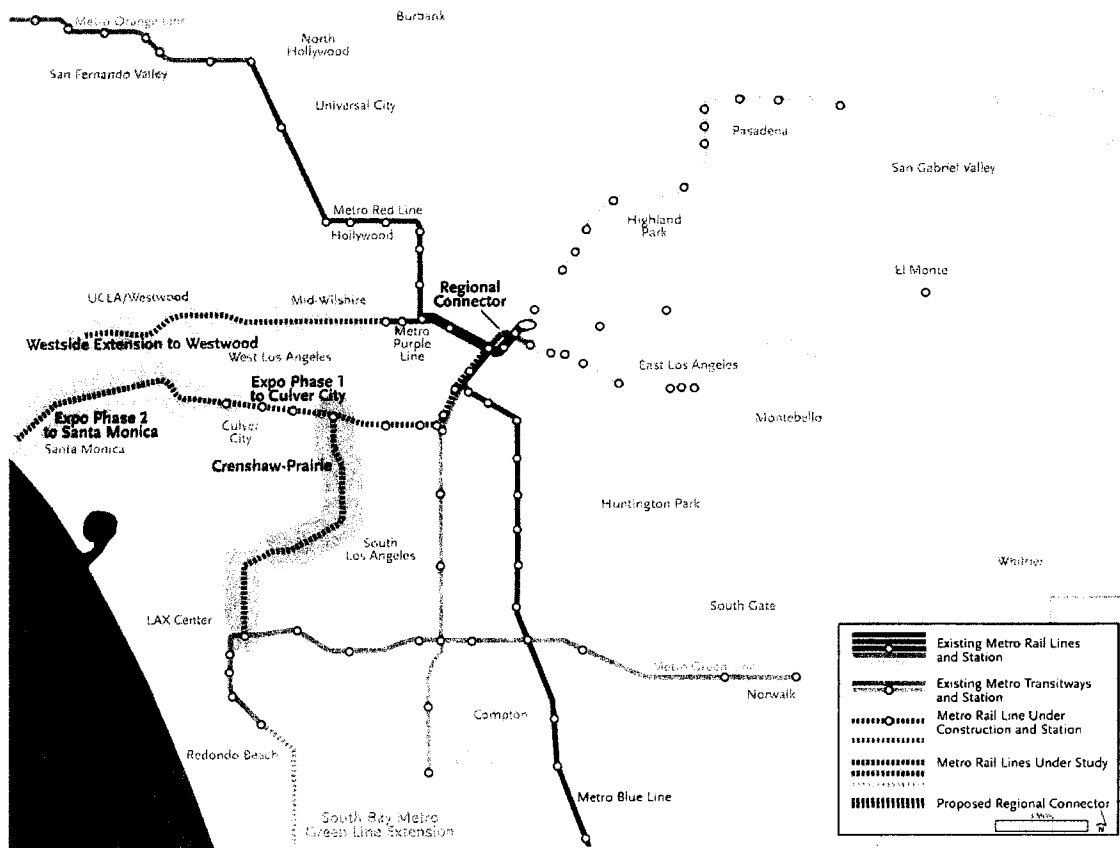
This section summarizes the Project scope as described in the latest Administrative Final Environmental Impact Statement/Report (Administrative FEIS/FEIR) dated May 2011.

1.1. Description of Project Scope

The Regional Connector Project will form a crucial link in Metro's transit network. The Project located in downtown Los Angeles incorporates a 1.9 mile direct light rail link between the Metro Gold Line at Little Tokyo/Arts District Station at 1st Street and Alameda Street and the Metro Blue Line (creating a continuous north-south route) and Metro Exposition Line terminus at the 7th Street and Figueroa Street (creating a continuous east-west route).

The Project is included in the Southern California Area of Governments (SCAG) Regional Transportation Plan for 2008 and Metro's 2009 Long Range Transportation Plan (LRTP). The proposed technology is light rail transit compatible with the current Metro Rail operations for the Metro Exposition Line and Gold and Blue Lines.

Figure 1: Regional Transportation Projects



Source: Administrative FEIS May 2011

The project is included as one of the 12 designated by Metro and the City of Los Angeles as part of its 30/10 plan, which seeks to use innovative finance and delivery options to advance project delivery faster than would be achievable under conventional options. It was approved by the voters of Los Angeles County as eligible for receipt of Measure R funds authorized by the 2008 referendum.

The Project includes double track that would run from the existing platform at the 7th Street Metro Center station and run up Flower Street, curving northeast to connect via two proposed portals with the surface line of the Metro Gold Line to Pasadena and the primarily surface line Metro Gold Line to East Los Angeles.

The Locally Preferred Alternative (documented in the Administrative FEIS/FEIR, May 2011) includes the scope and proposed construction methods described below:

- The design, specification and development of a Tunnel Boring Machine (TBM). The TBM will be inserted to the northeast of 1st and Alameda streets, boring will commence at Central Avenue south of 1st Street and continue excavating westward. Tunnel boring activities would allow tunneling to proceed down Flower Street to 4th Street.
- The tunnel section from 4th Street connecting to the existing 7th Street Metro Center is proposed to be developed using a cut and cover approach. In addition, along Flower Street from 4th to the 7th Street Metro Center, an enhanced pedestrian walkway is proposed, by reducing the number of street lanes.
- Stations are proposed along the alignment as follows:
 - An underground station just south of the intersection of 2nd Street and Hope Street (the 2nd/Hope Street station).
 - An underground station between Broadway and Spring Streets (2nd/Broadway station).
 - An underground station at the Little Tokyo/Arts District, 1st Street/Central Avenue station, partially located within Central Avenue and the northern half of the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street.
- In addition, the scope includes proposals for pocket tracks and crossovers located beneath Flower Street between 5th and 6th Streets, just east of 2nd/Broadway station, near 1st and Alameda Streets and in the tunnel just north of the 1st Street and Central Avenue station.
- Traction power substation (TPSS) facilities are proposed at along Flower Street between 5th and 4th Streets and underground in the 2nd/Broadway station.

The operations and maintenance functions of the Regional Connector are planned to be incorporated into the existing operation and maintenance of the Metro Gold Line, Exposition Line and Blue Line.

1.2. Summary of Project Construction Costs and Schedule

The total project cost included in the Administrative FEIS/FEIR is \$1.367 billion in year of expenditure dollars. This estimate has been developed as part of the project Preliminary Engineering work and includes a 30% estimate for contingencies. With the exclusion of vehicles (to be procured separately) and finance charges (Metro allocated costs) the total capital cost of construction estimate for the Project is \$1.346 billion.

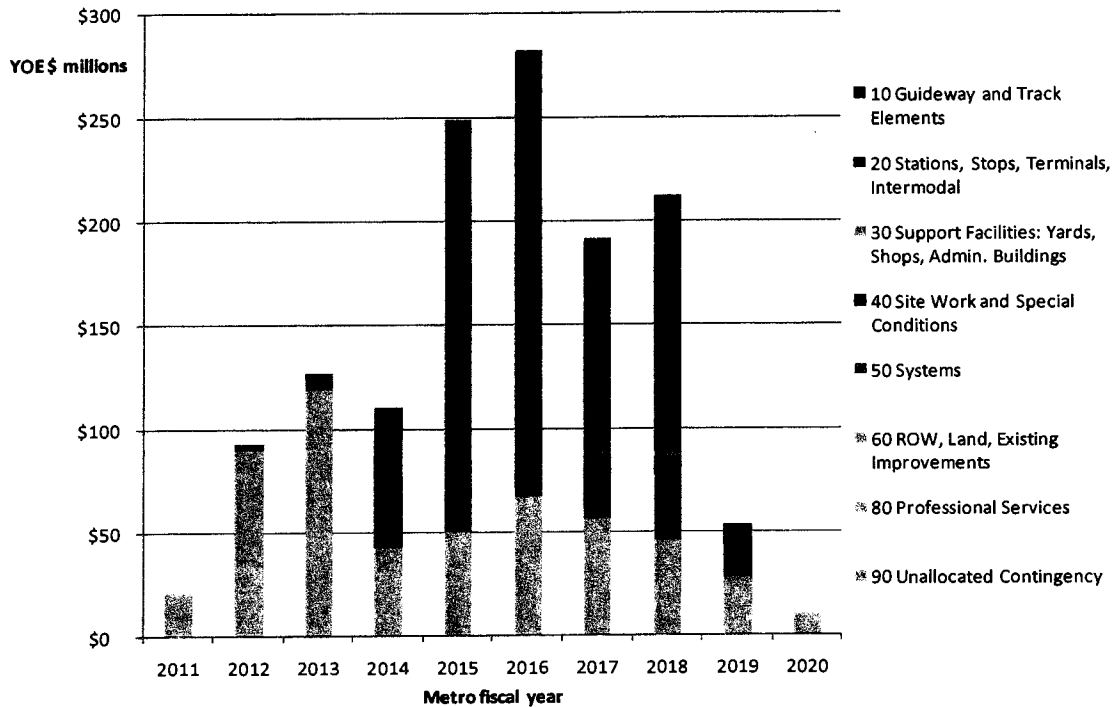
Table 2: Construction Cost Breakdown

FTA Standard Cost Categories \$ millions	2010 \$	YOE \$
10 Guideway and Track Elements	\$ 233	\$ 275
20 Stations, Stops, Terminals, Intermodal.	\$ 271	\$ 326
30 Support Facilities: Yards, Stops, Admin. Buildings	\$ 2	\$ 3
40 Site Work and Special Conditions	\$ 139	\$ 161
50 Systems	\$ 44	\$ 56
60 ROW, Land, Existing Improvements	\$ 127	\$ 136
80 Professional Services	\$ 228	\$ 265
90 Unallocated Contingency	\$ 106	\$ 125
Sub total	\$ 1,151	\$ 1,346
70 Vehicles	\$ 18	\$ 20
100 Finance Charges	\$ 1	\$ 1
Total	\$ 1,170	\$ 1,367

Source: Admin FEIS/EIR May 2010

The Record of Decision is expected to be issued in Winter 2012, after which it is anticipated that procurement and securing of funding will be completed. Construction is scheduled to start in 2014, with 80% of total construction excluding vehicle purchase slated to be completed by 2018. The graphic below illustrates the capital expenditure profile for the Project between 2011 and 2020.

Figure 2: Construction Cost Profile, Excluding Vehicle Costs



1.3. Summary of Operations and Maintenance Costs

The proposed project will result in the connection of the Metro Gold Line, Metro Exposition Line, and Metro Blue Line resulting in two continuous routes:

- North-South: connecting Claremont to Long Beach using the Metro Gold Line, Regional Connector, and Metro Blue Line tracks; and
- East-West: connecting Santa Monica to East Los Angeles using the Metro Expo Line, Regional Connector, and Metro Gold Line Eastside Extension tracks.

Light rail trains will operate on these routes at 5 minute intervals. The addition of the Project is expected to increase Metro's system wide operations and maintenance cost by approximately \$14.6 million in 2035 (approximately \$7.4 million in 2011 dollars¹).

Metro has confirmed that the vehicle purchase, expansion of the Metro Operations Center, replacement and the operations of the trains and system components associated with the Project are to be delivered and operated outside the scope of this assessment. The remaining maintenance and lifecycle elements of the Project have been considered in this business plan. These include responsibility for the routine maintenance and lifecycle costs (capital maintenance costs) for the following Project scope components: tunnel lining to underside of rail, stations and station fittings, escalators, elevators and other civil components.

¹Source: Administrative FEIS/EIR May 2011, page 6-15 describes LRT only cost impacts

1.4. Summary of Implementation Schedule

The implementation schedule for the Project is subject to continuous change. For the purposes of this report, the schedule for implementation of the Project following the Record of Decision is as shown below.

Table 3: Project Timeline

Milestone	Timing
Final EIR/EIS	Summer 2011
FTA Record of Decision	Winter 2012
Final design	1 – 2 years
Construction	4 years
Revenue service begins	2019

Source: Administrative FEIS/FEIR May 2011

Assuming the Project is procured under a DB or DBFM, procurement would likely be initiated after ROD and the contract awarded concurrent with the completion of Preliminary Engineering activities. The developer would then be responsible for completion of final design as part of the DB or DBFM contract.

1.5. Summary of Project Funding Sources

Metro has allocated a total of \$1.367 billion in public funding for the Project from a variety of local, state, and federal sources, as summarized below. This funding amount includes the procurement of vehicles and Metro's project financing costs.

Table 4: Metro Funding Plan

Metro funding plan	YOE \$ millions	% of total funding
<u>Federal sources</u>		
Section 5309 - New Starts (60% of Costs)	\$ 819.60	60%
<u>State sources</u>		
High-Speed Rail Bonds	\$ 114.90	8%
Proposition 1B	\$ 149.60	11%
Regional Improvements Program Funds	\$ 2.00	0%
<u>Local sources</u>		
Measure R Sales Tax-backed QTIBS	\$ 160.80	12%
Lease Revenue	\$ 0.20	0%
LONP Reimbursement Fund 3562	\$ 78.90	6%
Local Agency Funds (3% of Costs)	\$ 40.90	3%
TOTAL SOURCES OF PLANNED CAPITAL FUNDING	\$ 1,366.90	100%

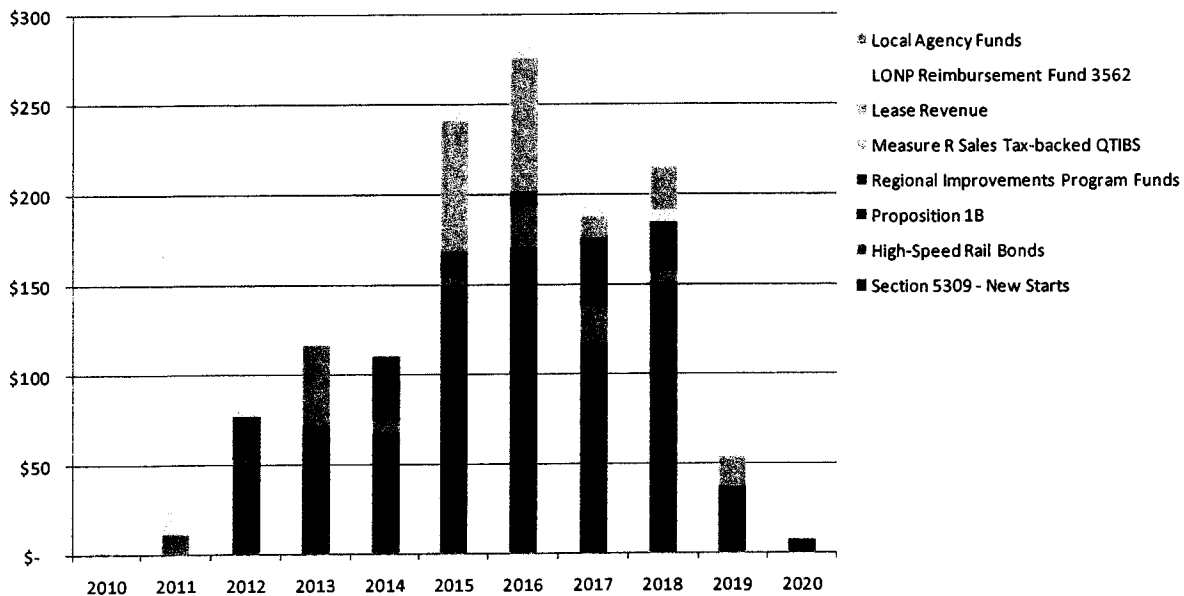
Source: Administrative FEIS/FEIR May 2011

The Project funding plan relies heavily on an FTA New Starts contribution of \$819.6 million, or 60% of the total funding required. The funding plan shown (refer to Figure 3) includes FTA funds drawn in 2012, which assumes the securing of a Full Funding Grant Agreement (FFGA) following ROD expected in Winter 2012.

Other major planned funding sources include State transportation bonds, including High Speed Rail Proposition 1A and Proposition 1B funds, at \$114.9 million and \$149.6 million, respectively. High Speed Rail bonds are subject to approval by the State legislature.

Measure R sales tax revenues totaling \$160.8 million have also been programmed for the project. Metro plans to issue a new form of sales tax revenue bonds dubbed "QTIBS" secured by these revenues. The accelerated project schedule presumes the availability of two federal programs to leverage Measure R dollars, the Transportation Infrastructure Finance Innovation Act (TIFIA) and Qualified Transit Improvement Bonds (QTIBs). As Measure R sunsets in 2040, this analysis presumes that all financings backed by Measure R mature by that date.

Figure 3: Metro Forecasting: Regional Connector (Aug 2010)



Source: Metro Blue Book funding profile

During the construction period starting in FY 2012, the "early" funding sources currently programmed to support the Project's capital costs include FTA New Starts, High Speed Rail Proposition 1A bonds and LONP Reimbursement Funds, with proceeds from Measure R-backed QTIBs scheduled to occur later, beginning in FY 2015. The Proposition 1B allocation of \$149.6 million includes an initial expenditure of \$24.9 million in FY 2012, with the majority of the allocation spent later in the construction phase from FY 2014 to FY 2018. Local agency contributions represent the last dollars in, along with the closeout of the FTA New Starts FFGA in FY 2019. The risks associated with the timing and quantum of funding from these various sources are discussed in Section 3.4.

1.6. Environmental Impact and Process

The Metro Board approved the Draft Environmental Impact Statement / Environmental Impact Report (EIR/EIS) and the Locally Approved Alternative in October 2010. The final EIS was published in the summer of 2011 and the Record of Decision for the Project is expected in Winter 2012.

2.0 EVALUATION APPROACH

This section describes Metro's goals for the 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 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 analyze a range of possible delivery options for the Project.

The objective of this business plan is to develop and analyze a range of possible delivery options for the proposed Project and to determine what, if any, role there might be for private participation in the design, construction, financing, and/or maintenance of the Project or of particular project components.

The business plan includes a summary description of the Project followed by an analysis of key Project information relevant to delivery options: scope, schedule, cost, funding and risk. This Project information is used to develop a short list of potential delivery options in accordance with the following assumptions:

- rolling stock will be procured separately by Metro;
- rolling stock maintenance will be performed by Metro; and
- vehicle operations will be retained responsibilities for Metro.

In addition, Metro has opted to utilize a Design-Build approach for the Project delivery.

Therefore, these considerations limit the range of potential delivery options to be analyzed to those along a spectrum of risk transfer alternatives beginning with Design-Build and moving through to Design-Build-Finance-Maintain. These are:

- Design-Build (DB) - under which Metro would transfer responsibility for final design and construction to a DB contractor and retain the responsibility for operations, maintenance and finance. This option will be used as a "base case" for the analysis;
- Design-Build-Finance (DBF)-under which a private developer would initially finance the construction as well as design and construct it;
- Design-Build-Finance-Maintain (DBFM)- under which a private developer would take the responsibility for design, construction, financing and maintenance (non-vehicle) under one P3 contract.

The DBF option, also sometimes called turnkey, was not included in the analysis as the Project does not fit the typical profile for successful DBFs, for the following reasons:

- DBF is typically attractive for smaller projects, usually less than \$500 million - with repayment profiles matched to the tenor of available contractor financing, which today is less than 10 years. The Project is greater than \$1 billion, and has access to longer term bond financings in the 30-40 year range.
- DBF is typically used where the profile of project expenditures does not match the timing of expected funding. Most commonly, it is used to pay for construction, with the contractor then being repaid immediately upon Project acceptance or within a few years afterward. Metro's Project funding plan is expected to provide funds necessary for construction when they are required, assuming that the assumptions on timing of grant funds within that plan are credible.
- The underlying financing costs for a DBF reflect the contractor's cost of money, and will generally be far higher than the cost of Metro's funds. In addition, the financings will be taxable, and, all else being equal, will carry an interest rate 30 to 40 percent higher than the tax-exempt rates accessible to Metro.

The conclusions of this business plan are based on the advantages and disadvantages of the selected delivery options and the extent to which the options meet Metro's evaluation criteria relative to the current delivery option that Metro is understood to be following for this Project. The analysis is qualitative in nature and does not attempt to calculate or compare the cost of each option.

2.2. Program Goals

As part of its Public-Private Partnership (P3) Program, Metro identified five major goals and related 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:

- **Optimize risk transfer.** By allocating risks to the party best able to manage them, an optimal risk profile may be achieved. The benefits of this approach include enhanced certainty of project price and delivery schedule.
- **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.** Schedule certainty is of great importance to Metro, 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 has identified a desire to accelerate transit project delivery as the region's highways face increasing 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 below, 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 LA 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.

2.3. Approach for Evaluation of Alternative Delivery Options

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 Project and documented by the Metro Project team. To do so, the team held a multi-day risk workshop, during which the Project was evaluated against various components of work expected to occur during its development, delivery, and operating phases. Each was then assessed as to what could affect a positive outcome, and the likelihood of each risk actually occurring was ranked. The resulting matrix, known as a risk register, became the foundation for the mitigation analysis phase of the assessment, which measured each of the potential project delivery mechanisms against each risk and ultimately, against Metro's goals.

The main categories of risks looked at were:

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

This analysis is described in detail in Section 3 of the report.

3.0 PROJECT RISKS

This section presents a qualitative summary of the technical, financial and economic risks that Metro may encounter in delivering the Project, regardless of the 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:

- Risks that may impact design and construction costs and completion date;
- Risks that may impact the cost of long term asset maintenance, rehabilitation and replacement; and
- Risks that may impact the project from a funding, financial and economic perspective.

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:

1. Regional Connector Transit Corridor Risk Contingency Management Plan dated October 29th, 2010;
2. Regional Connector Transit Corridor Administrative Final EIS/EIR dated May 9th, 2011; and
3. Risk Management Monthly Progress Report dated June 2011.

In addition to these Metro sources, the discussion below also incorporates risk analysis carried out by the InfraConsult team as part of its Task 3 Strategic Assessment report.

3.1. Summary of Key Project Risks

Key project risks are summarized as below:

- **Increase in project capital costs due to inflation.** This 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. While inflation has been stable for many years, economic direction and inflation projections are currently subject to widespread conjecture and disagreement in the near term.
- **Difficulty in estimating right-of-way costs.** 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 right-of-way acquisitions for the Project.

- **Increase in capital costs due to concurrent implementation of multiple large infrastructure projects within Los Angeles County.** This has the potential to impact the availability of qualified labor causing labor price pressure. 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 which impact costs 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, right-of-way acquisition, utility relocation, procurement and authorization delays, and general construction delays.
- **Scope change and design risk can have a significant impact on the project budget.** Cost increases occur as a result of unexpected ground, geological and environmental conditions and unknown or unexpected utility relocations.
- **Delays associated with project funding.** The primary funding sources for the Project are not yet fully authorized. New Starts and High Speed Rail bond funds require approvals from the Federal Government and the State Legislature. Measure R revenue can fall below projections, effecting the timing of their availability for the Project expenditures. Delays in receipt of funding and financing and potential changes in scope that require additional funding amounts could potentially affect Metro's ability to deliver the project within budget.
- **Construction phase 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 the Project in the form of contingencies.

The following list summarizes the main risks that may impact the Project's schedule and cost during the construction phase:

Interoperability of other parts of the network: The Project will connect existing operating lines in downtown Los Angeles, inevitably creating challenges in operating the system network-wide:

- The expansion of the Metro Operations Center may not be completed in time for the Project, and/ or additional shared costs towards the expansion of this facility may be allocated to the Project if other 30/10 planned projects are cancelled.

- Design changes possibly required by the separately designed and procured systemwide train control system could increase the final cost of the current Project cost estimates include only preliminary estimates for these components.

Complex site conditions: There are a number of complex site condition issues related to delivery of this Project:

- Any delay in the relocation of the 75" storm drain at Alameda Street could delay construction.
- The potential presence of Volatile Organic Compound (VOC) contaminated soils, such as were encountered during the construction of the Red Line in the late 1980s and early 1990s. Current treatment facilities may not have sufficient capacity and therefore treatment of the contaminated soils could add to the Project cost by requiring construction of treatment facilities or long-distance shipping to distant facilities.
- Uncertainty over the depth of the existing utilities, particularly at intersections in the cut and cover sections of the project. This could lead to an increase in complexity of the utility relocations and subsequent increase in preliminary engineering work.
- Geotechnical properties associated with the Fernando formation, potentially indicating softer ground than the current characterization has indicated. Mixed ground and face conditions can often lead to delays in tunneling operations.

Complex construction and design issues associated with a project of this nature:

Extensive tunneling and underground work will lead a number of technical challenges on the Project:

- Uncertainty over the fire life, ventilation and safety strategy and design. Computational fluid dynamics and simulations have not been carried out to determine the overall ventilation requirements. If the project is ultimately required to comply with NFPA 130 this could have significant impacts on the ventilation required and the current cost estimates associated with additional work.
- Complexities and methodologies of constructing the deep stations at 2nd and Broadway and 2nd and Hope Street. These stations are currently planned to be constructed using cut and cover but the depth, of up to 130 feet, may exceed the practical depths of using soldier piles. If it became necessary to change the construction methodology to mined excavation rather than cut and cover, the Project cost would likely increase significantly, and the schedule could well need to be extended.

3.2. Operations Phase Risks

Predicting maintenance costs while still in the preliminary engineering phase is quite problematic, due to the unknown final scope of the Project, as-yet unspecified mechanical and electrical equipment, uncertainties about actual operating procedures, the complex interaction between preventive maintenance and

replacement cycles, and the difficulty of predicting economic factors such as inflation that have significant impact on the cost of future activities.

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).
- Increases in the cost of materials, utilities, labor and equipment beyond that originally projected.
- Unexpected soil conditions that 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 which could 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.
- 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 might result in increased maintenance costs and an unexpected need for replacement outside of warranty period.
- Change in maintenance standards, procedures and safety standards such as working hours.

3.3. Funding Risks

This section summarizes the risks faced by Metro in delivering the Project within the planned funding approach, specifically risks associated with the following areas that may impact the Project delivery:

- Variations in the timing of planned and programmed funding availability;
- Changes in the amount of available Metro funds; and
- The ability to secure requested amounts of State and Federal funding.

The following is a discussion of the specific risks associated with the various funding sources that are currently planned for the Project.

3.3.1. FTA New Starts

Prior to award of the FFGA, the Project funding plan remains at risk of changes in both the quantum and timing of funds anticipated from the FTA New Starts program. In its FY 2011 budget, the U.S. House of Representatives has proposed a cut of 30% to the overall FTA New Starts program, and there is yet no agreement within Congress on a longer term authorization for the program.

Given the uncertainty surrounding a timeframe for a surface transportation reauthorization bill in Congress and the potential for a significantly reduced future budget for the New Starts program, there may be limits imposed on the amount of annual FTA funding that Metro can receive both for individual projects and collectively as an agency (i.e. for its other New Starts projects that are scheduled to be constructed during the same period). Should these limits materialize, it may be necessary to reduce the Project's reliance on New Starts funding to a level below the current 60%.

With such a large component of the Project costs being funded from one source, the uncertain level of federal funding available for the New Starts program presents a significant risk to the Project schedule and cost.

3.3.2. High-Speed Rail Bonds (Proposition 1A)

In November 2008, California voters approved Proposition 1A authorizing the issuance of up to \$9.95 billion in general obligation bonds for the construction of a statewide high-speed rail system, including \$950 million for local or regional feeder systems that would enhance ridership and patronage on the overall system. The Regional Connector is currently programmed to receive \$114.9 million in High-Speed Rail (Proposition 1A) Bonds. The issuance of these bonds is contingent upon the approval of the State Legislature. Recently, Governor Brown exercised his line-item veto authority to reduce Proposition 1A funding for feeder systems from \$154.3 million to \$7.0 million for FY 2012, citing the lack of a "comprehensive statewide rail plan." Any delays in future legislative approval could jeopardize the timely completion of the project.

3.3.3. Proposition 1B

Proposition 1B funds are to be allocated to the Project from the Public Transportation Modernization, Improvement, and Service Enhancement Account (PTMISEA) subaccount. The project is part of the FY 2011/12 budget cycle allocation. Funds from this source must be encumbered and fully liquidated by June 2017.

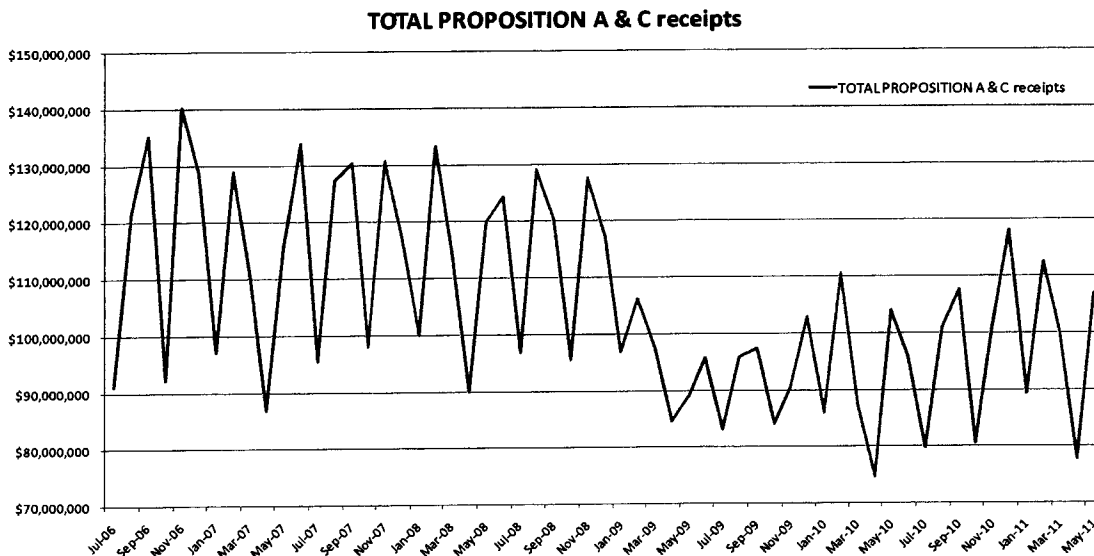
The recent delay of bond sales has already impacted the availability of PTMISEA funding for the both the FY 2008/09 and FY 2009/10 cycles. Any further deterioration of the State's fiscal health and/or credit rating could delay the availability of Proposition 1B funding for the Project, negatively impacting the schedule.

3.3.4. Measure R

Measure R funds totaling \$160.8 million have been programmed for the Project. Measure R funds are dependent on the collection of the sales tax, driven by the local

economy and as a result, reduced sales tax collections due to poor economic times may impact Metro's ability to deliver the entirety of its Measure R transit program including the Regional Connector. An indication of the recent volatility in sales tax revenues can be seen from the receipts for Proposition A and Proposition C for the past five years.

Figure 4: Sales Tax Receipts for Prop A and C



Source: LA Metro website

In contrast to other transit projects comprising its broader “30/10” or “America Fast Forward” initiative, such as the Westside Subway Extension, Metro has programmed all Measure R revenues for the Regional Connector in the first decade of the 30-year sales tax measure, in a manner generally congruent with the construction cost curve of the project from FY 2012 through FY 2019. However, it may choose, at its option, to leverage those funds through the issuance of bonds to allow other projects to proceed earlier.

Proposed amendments to section 54 of the Internal Revenue Code would create a new class of qualified tax credit bonds, Qualified Transportation 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. These bonds are projected to lower the overall cost of project financing for Metro’s entire program of transit projects, compared to traditional tax-exempt bond financing. The intent is to use Measure R funds to support the repayment of QTIBs issued to finance capital expenditure on the Project as well as on other projects in the LA Metro program. However, as noted in the previous paragraph, the Project does not require this leveraging mechanism to ensure the availability of sufficient Measure R revenues to meet the capital costs of the project during the construction period.

Therefore, the potential challenges associated with the amendments to section 54 and subsequent enactment of QTIBs legislation at the federal level represents a relatively

minor risk to the project's financial viability in the context of the other funding risks discussed above, particularly reductions in FTA New Starts funding and cancelled/deferred transportation bond issuances for Prop 1A and Prop 1B at the State level.

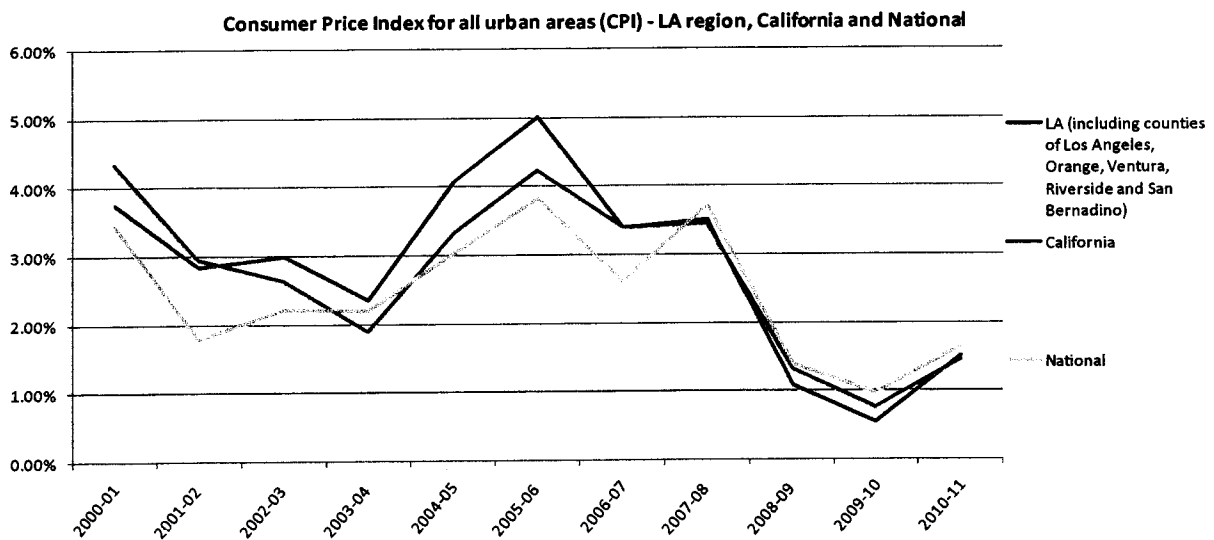
3.4. Economic Risks

The uncertainty surrounding the ability to forecast inflation of costs and revenues over the expected construction timing and operations life of the asset is a fundamental risk. The impact of inflation is influenced by the timing of the expenditures and the demand for the underlying commodities and labor associated with the Project costs. Therefore, the ability to deliver the Project within the funding plan will be impacted by:

- Any delay to the Project schedule, whether to the start of construction or its duration; and
- Higher than projected increases in labor costs and commodities prices which may result from the overheating of the labor market and the scarcity of certain types of building materials as construction demand ramps up after this recession.

The current forecast construction cost inflation for the Project is 2% for 2011 and 3% from 2012 to 2020.²Evidence 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%³ within the last 10 fiscal years.

Figure 5: CPI Index for LA Region, CA, and National



Source: California Department of Finance

²Source: Administrative FEIS/FEIR May 2011

³California Department of Finance data website

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.

4.0 P3 PROCUREMENT OPTIONS ANALYSIS

This section summarizes the delivery options for the Project and describes the evaluation of each option against specific objectives defined by Metro staff.

4.1. Summary of the Design-Build Option

Metro is planning to procure the Project under either one or two Design-Build contracts, covering the delivery of the tunnels (including the stations and structural box excavation) and the design and delivery of the tunnel boring machine ("TBM"), and including the stations, track work, systems and systems integration testing. Metro plans to retain control over the performance specifications for the TBM and for executing necessary utility relocation work. In addition, Metro would retain the following activities outside of the Design-Build contract(s):

- Initial design activities (Preliminary Engineering ("PE") work) for the Project;
- Acquisition of right of way (ROW);
- Vehicle procurement (expected to be done under a system wide rolling stock procurement);
- Rail operations and maintenance, as well as routine and capital maintenance for the tunnel and civil structures. It is expected that these activities will be folded into existing operations on the Metro Gold Line, Metro Blue Line and Metro Exposition Line with the formation of continuous routes both north-south and east-west; and
- Expansion of the Metro Operations Center.

The Project construction costs are to be funded as described under Section 1.5.

4.2. Summary of the Design-Build-Finance-Maintain Option

A Design-Build-Finance-Maintain ("DBFM") approach has been identified in the earlier Task 3 analysis as an alternative that might suit the Project scope and Metro's desire to retain rail operations and rolling stock procurement. This option would be achieved by expanding the Design-Build concept to include components of the ongoing routine and capital maintenance activities, as described below, over a contract term that could be up to 35 years.⁴ The DBFM developer would typically be compensated by a series of annual payments linked to the quality of service and availability of the asset for use by Metro.

⁴Denver RTD Eagle P3 – 35 year availability payment deal

4.3. Analysis of the Options

The delivery options have been analyzed against the following criteria, developed from program objectives as defined by Metro staff:

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

4.3.1. Optimize Risk Transfer

A key value driver in project delivery is the allocation of risks to the parties best able to manage them. By seeking an optimal allocation of risk, project best achieves its potential for delivering value for money to Metro. The ability of each project delivery option to transfer risk has been analyzed as follows:

- **Contract size and scope:** As noted above, Metro plans to use a Design-Build approach to procuring the Project, but has not yet decided whether to use one or two contracts. Reducing the number of contracts from two to one will have the positive effect of reducing the number of contractor interfaces; increasing the size and scope potentially allows a greater opportunity for innovation in delivery. Adding the maintenance component under the DBFM approach could lead to further reductions in the risk premium, depending on the size of the maintenance component, by creating a greater incentive on the part of a private developer to manage and mitigate risks by being responsible not only for design and construction but for the maintenance of the asset throughout its lifecycle.
- **Cost and pricing:** It is not expected that the degree to which Metro will be able to transfer construction and pricing risk would be different between the DBFM option and a DB option, as both are based on a design-build contracting approach for the Project construction. Under the DBFM delivery model, however, pricing and inflation risk for the future maintenance component is transferred to a private developer reducing the risk profile retained by Metro, including the following identified risks:
 - Uncertainty in forecasting future costs;
 - Deferred or poorly performed maintenance resulting in reduced asset life and higher replacement cost;
 - Obsolescence of components included under the DBFM contract; and
 - Uncertainty in the cost of equipment replacement.

Even with those risks transferred, though, it is unlikely that the developer's base cost of maintenance will be lower than Metro's, as it will have to carry a very high overhead for such a small section of the infrastructure. The difficulty of

working within a constrained site, in many places deep underground and without adjacent areas for the contractor's material and equipment storage, and of scheduling crews over such a small Project base, will translate directly in higher costs than would be achievable if the logistical and overhead costs were spread over a wider base. This "diseconomy" of scale is a direct result of the relatively short (1.9 mile) length of the Project.

- **Metro retained risks:** Several items included in the Project scope create delivery risk for the Project that will likely not be fully transferable under either option and for which Metro will retain some shared risk. These include:
 - The construction of deep stations;
 - Geotechnical conditions of the Project right of way;
 - The presence of contaminated soils; and

These are in addition to those risks that Metro has chosen to retain as its own, such as right of way acquisition and utility relocation.

- **Size of the maintenance component:** Under the DBFM option, maintenance responsibilities for some of the infrastructure are transferred to the DBFM contractor. Due to the small scale of the completed Project, and the likelihood that many of the installed components will need no significant maintenance for years, the size of the maintenance component of the overall contract will be very small. Therefore, it is highly unlikely that the addition of maintenance would cause a developer to be willing to shift risks or returns beyond the construction period, meaning that the Private Partner would expect to be repaid the bulk of construction funds shortly after completion and would not be willing to place them at risk over the life of the asset. (Note: the potential for risk transfer would be substantially increased if the maintenance responsibilities for the existing Metro Blue, Gold, and Expo Lines were included in the proposed DBFM.)
- **Maintenance Interface risk:** While the "DB" portion of the DBFM option may increase the potential for innovation in delivery by allowing for a greater construction scope to be delivered by a private developer, addition of the maintenance responsibility may offset some of those benefits. The location and functionality of the Project create unique interface risks to the entire system, given that it connects two rail lines that run to the north, south, and west of the Project. The areas of responsibility between the various operators, maintainers and contractors will be difficult to define and may well create an environment where disputes occur and prove difficult to resolve. The ability to establish and implement a risk and performance based contract, such as a DBFM, for a central section of the network situated within two existing lines presents a significant challenge and a risk to the Project.
- **Expansion of the Metro Operations Center timing:** The Project's operational start date is dependent on the timing of the delivery of other system wide components, including the Metro Operations Center and vehicle acquisition, which are outside the scope of either option analyzed herein. However, under a DBFM option, which includes an ongoing maintenance component, any delay

to the start of operations caused by Metro would likely result in a claim for developer compensation. This would not be a factor in the DB option.

- **Life cycle maintenance (replacement) risk:** This risk is transferred under the DBFM option for a period of approximately 35 years. The benefits of this risk transfer will have the largest impact on those assets with shorter replacement cycles such as systems and communications equipment, station mechanical, electrical and plumbing facilities, and elevators and escalators. Longer life assets, such as structures and track, have replacement cycles longer than the contract term, and therefore the DBFM contractor's activities will be limited to preventative maintenance for these elements.

4.3.2. Achieve a Cost Effective Use of Public Funds

Achieving a cost effective use of public funds depends on several factors in the Project delivery.

- **Construction pricing inflation:** The risk that project capital costs increase due to inflation and exceed available funding may be transferred to a private developer under both DB and DBFM approaches.
- **Maintenance price inflation:** The risk that the project maintenance costs increase over the term due to inflation and exceed available funding may be transferred to a private developer under the DBFM approach. However, the economy of scale that Metro may achieve using a system wide approach to maintenance may outweigh the benefits of transferring this risk to a private developer.
- **Schedule delays:** In the short term, developing and negotiating a DBFM contract may present a schedule risk to the Project potentially leading to cost overruns due to Metro's relative lack of experience in performance based contracting. In the long term, Metro would be able to manage schedule risk post-commercial close by agreeing to a fixed date delivery agreement under either a DB or DBFM. However, several risks remain with Metro under either delivery option:
 - Metro change orders;
 - Delays in right of way acquisition or property access due to delayed utility relocation;
 - Delays in environmental approvals;
 - Stakeholder negotiations; and
 - Securing federal, state and local funding on schedule.
- **Market capacity:** Maximizing the competitive tension of a procurement process under a DB or DBFM will require a number of sufficiently experienced market participants. The financial close of the \$1.6 billion Eagle P3, between Denver RTD in Colorado and private consortium in August 2010 provides indication that there is capacity and interest in the current transit infrastructure market for a Project of this size (\$1.3 billion). However, the relatively limited size of the maintenance component of this Project and the potential risks associated with managing only a small segment within a larger network may prove challenging for private

developers and investors and has the potential to limit the responses, and consequently competitive tension.

- **Use of private finance:** A DBFM would allow Metro to better leverage its available public funds, both by bringing private equity into the project and by using private finance to bridge initial funding gaps. By structuring the project as an availability payment over a defined term, Metro may be able to use Measure R funds to make payments to the private developer while not impacting its debt capacity. This would allow for a greater use of funds on hand in the near term and create budget certainty for the entire transit program.

4.3.3. Ensure Asset Quality Throughout the Asset Lifecycle

By combining whole-life maintenance components and replacement responsibilities with the construction of the Project, as under a DBFM agreement, a private developer is able to optimize risk management and increase value engineering opportunities. However, with regard to the Project, these benefits may be limited as discussed below.

- The integrated nature of the Project within the rail network would create difficulties in implementing a performance monitoring system that effectively makes the private developer accountable and incentivizes appropriate behavior.
- A DBFM approach typically incentivizes a private developer to manage the risk of construction and maintenance so as to result in a pre-defined level of service for the public, which if not achieved has a financial impact on the developer through lower payments. This approach relies on an ability to monitor and enforce a performance regime. Such a regime may be difficult to monitor for the Project tunnel components due to the short tunnel length of this Project, however, may be practical for the station elements. Separating out responsibility for the stations and key components such as elevators and escalators would be feasible, either combined with construction or simply as along-term maintenance contract, and is a recommended course of action.

4.3.4. Accelerate Project Delivery

Several risks have been noted that may impact the Project's implementation schedule and timing of operations start. These include:

- Schedule delays that may be caused through changes in scope, delays to permitting, protracted stakeholder negotiations, and delays in site access due to delayed right of way acquisitions or utility relocations, among other general construction delay issues;
- Delays caused through the inability to secure the amount of funding as scheduled to meet project needs; and
- Uncertainty in the completion timing of external components required for the Project operations start date, including the Operations Center and vehicle acquisition.

Both delivery options use a design-build approach to the construction phase, through which the schedule may be accelerated by value engineering opportunities enhanced by combining the responsibilities for design and build – for example, undertaking concurrently early works while design process is still underway. However, under both a DB and DBFM the project schedule will remain at risk of delay through those elements that Metro retains responsibility for both within the Project scope, such as the utilities and right of way components, and outside of the project scope such as delivery of the Operations Center.

Extending the pre-construction period to accommodate a lengthy document preparation and negotiating period for the DBFM could also create schedule delay.

But the largest potential delay arises from the risks associated with the security and commitment of funding sources. If the America Fast Forward plan is unsuccessful and the FTA New Starts Full Funding Grant application is unsuccessful or altered in terms of timing and amount, then a DBFM option based on leveraging Measure R would allow Metro the opportunity to continue with the Project delivery, although perhaps not at the lowest overall cost

4.3.5. Provide Highest-Quality Service for the Traveling Public

Several risks have been noted that may impact the service quality for the traveling public associated with the Project. These include:

- Delays during the construction period for almost any reason can put pressure on all parties to meet the operational start date at all costs. If those costs include short-cutting performance and acceptance testing protocols and schedules or opening for service without full acceptance, there can be a long-term impact on system quality under either a DB or DBFM approach.
- Failure by Metro to enforce the DB contract's construction standards, properly perform acceptance testing, and perform required warranty service could affect long-term system quality.
- Failure to properly manage and monitor the long-term maintenance obligation of the Private Partner under the DBFM may contribute to the risk of reduced service quality if performance of maintenance by the private developer is not clearly monitored through a proper regime and interface risk with Metro rail operations is not effectively managed. The ability to monitor the performance of maintenance services of a private developer within the small section of the line (excluding the station components) will be difficult due to the embedded nature of the project within the network.

4.4. Results of Options Analysis

The analysis has been summarized below.

Table 6: Results of Options Analysis

Objective	DB option	DBFM option
<p>Optimize risk transfer:</p> <p>Construction</p> <p>Maintenance and Ops</p>	<p>A single DB contract may lead to greater innovation as the DB contractor is able to optimize the approach by having greater responsibility.</p> <p>Integration of the Project into the existing transit network is of critical importance. Metro is proposing to meet this risk by using existing operations and maintenance capacity on existing lines to cover the needs of the Project.</p>	<p>A single DB contract may lead to greater innovation as the DB contractor is able to optimize the approach by having greater responsibility.</p> <p>Combining construction and maintenance will lead to better lifecycle planning</p> <ul style="list-style-type: none"> - Interface risks may occur due to connectivity to two separate lines at the North and South of the Project; - Setting a performance regime that optimizes the risk transfer may be difficult for a Project located within 2 existing lines.
<p>Achieve most cost effective use of public funds</p>	<p>The DB option would include a fixed price DB contract to be funded mainly from New Starts (\$819m) and Measure R (\$160m).</p>	<p>The cost per mile (Project totals 1.9 miles) associated with adding the additional maintenance component under the DBFM option may not lead to value for money as compared to the DB option, when considering the risk transfer issues described above.</p>
<p>Ensure asset quality throughout the lifecycle</p>	<p>Responsibility for the Project over the life would be met under existing Metro's practices and guidelines.</p>	<p>The DBFM option would likely face challenges in the development and enforcement of a performance regime due to the integrated nature of the Project with respect of the Network.</p>
<p>Accelerate project delivery</p>	<p>Metro is proceeding toward an expected ROD in Winter 2012 for a DB delivery option. A major schedule risk to the Public option delivery is the Project reliance on 60% New Starts funding.</p>	<p>The DBFM option may potentially require a longer lead time due to the additional complexity of a negotiating a performance based contract including a maintenance component.</p>
<p>Provide highest-quality service for the traveling public</p>	<p>It is expected that operations and maintenance responsibilities for the Project will be incorporated within the network.</p>	<p>The Project size may limit the ability to monitor performance and may increase the risk of service quality reduction for non-station components by enhancing interface risk.</p>

The options assessment appears to show that due to the size of the project and its critical importance to the network operations and connectivity, it is likely that the potential costs associated with transferring the responsibilities of any ongoing maintenance component to a private partner would most likely outweigh the benefits of risk transfer and private sector innovation.

However, the ability to leverage Measure R funding as an alternative to the existing funding plan is worthy of consideration.

Given that the Project relies extensively on as-yet approved federal funding from the New Starts program of the FTA, its start date and ultimate schedule are quite dependent on the timing and amount of such grant funding. Should the Project secure a Full Funding Grant Agreement, the amount will immediately be set, but the timing will still be at risk of Congressional budget appropriations and perhaps even re-authorization of the Surface Transportation Act. However, delay in the receipt of funds can in and of itself affect the project cost, as lack of funds when programmed can cause delays which then cause inflation to increase project cost.

5.0 P3 FINANCING OPTIONS

This section describes the components of private finance used in P3 projects and the current P3 financial market.

5.1. Summary of Sources for the Proposed P3 Option

Under the proposed DBFM, the Project capital cost would be funded partially by private finance, to be repaid over the life of the contract term (usually 20- 35 years) in the form of an availability payment. Unlike a user-fee based project, where revenues are paid by users and demand risk is transferred to the private developer, under an availability payment structure the contractual payments would be paid over time from Metro funds (such as Measure R sales tax revenues). The payments would be sized to repay debt, to provide a return on invested capital, and to cover the contractual annual maintenance fees.

This difference impacts the financial structure as follows:

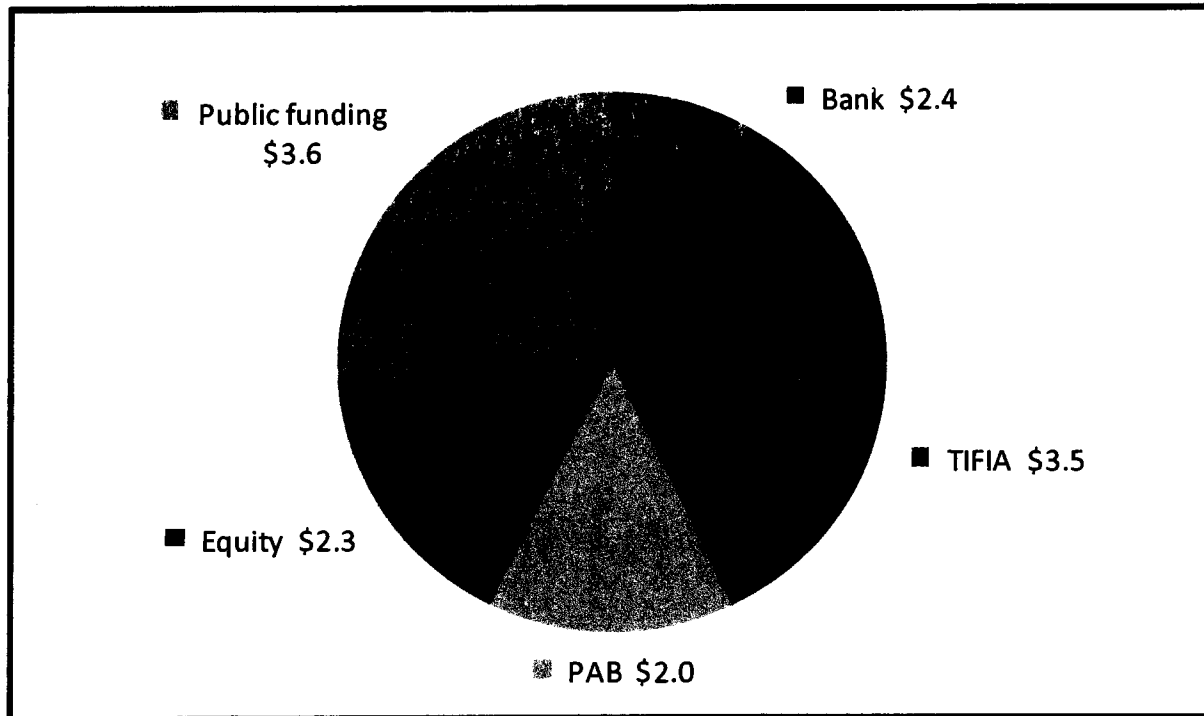
- Depending on the credit of the revenue source, higher levels of debt to equity may be achieved compared to user-fee based projects;
- The required returns for an equity provider may be comparatively lower (compared to user fee deals) due to the reduction in the risk profile; and
- Lenders may require comparatively lower debt coverage requirements and allow shorter 'tails' (a period of time at the end of a P3 contract during which there is no debt repayment, providing comfort to lenders that debt may be repaid).

For transit projects, whose revenues do not cover their operating costs let alone provide for any repayment of capital, availability based financings are the only choice. The cost of financing P3 projects will generally be higher on a pure financial basis than publicly funded transactions that can use long-tenor tax-exempt debt.

5.1.1. Options for Private Finance

Several sources of private finance are available for a project delivery and are discussed below. Debt options available include bank loans, Private Activity Bonds and TIFIA (for transport related projects).

Figure 6: Major Sources of Funds for Transportation P3 Deals 2007 – 2010
(shown in \$ billions)



Source: Data sourced from InfraDeals

5.1.1.1 Bank Debt

Due to the dominance of tax-exempt financing in the US, the use of bank debt in US P3 transportation deals 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. 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 - and potentially higher future cost - than a bond. However, it does have the advantage that proceeds are drawn periodically, as required, avoiding “negative carry” interest costs associated with bond financings. Banks often offer a shorter route to financial close than does the bond market, as the level of documentation and disclosure required is less burdensome and therefore often less expensive to prepare.

5.1.1.2 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 USDOT is reporting approved PAB allocations of \$5.1 billion, out of legal maximum of \$15 billion. Recently, Presidio Parkway in Northern California received an allocation of \$592 million - with financial close awaiting the resolution of outstanding litigation - and the Eagle P3 transit project in Denver, Colorado reached financial close on \$397 million in

PABs in August 2010. PABs offer an all-in cost of debt that can be less expensive than bank debt, as well as a long-dated solution that removes refinancing risk from the table.

PABs include several constraints including

- An allocation must be received from USDOT prior to issuance;
- 95% of proceeds must be spent within 5 years;
- Funds cannot be used to acquire or improve existing assets; and
- Federal rules governing arbitrage on invested funds must be followed.

5.1.1.3 Transportation Infrastructure Financing Innovation Act (TIFIA)

The USDOT competitively awards credit assistance for transportation projects to eligible applicants, which include state departments of transportation, transit operators, special authorities, local governments and private entities. Although not truly “private finance”, as the program is funded by the US Treasury, TIFIA is considered a tool that supports bringing private finance to projects.

There are several benefits and challenges associated with TIFIA assistance summarized below:

- A low cost of debt (SLGS rate plus one basis point) – 4.38% for a 35 year loan on July 7th, 2011⁵;
- Repayment terms which include accrual of interest and principal to allow projects to overcome early cash flow constraints;
- Demand exceeds funding supply, therefore applications are on a competitive basis;
- 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 debt.

5.1.1.4 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 all project costs, debt service and taxes have been paid. Equity return requirements vary widely based on the project’s credit and risk profile, and range from

⁵Source: FHWA TIFIA website

the low teens for availability payment investments to the mid-20s for user fee transactions.

5.1.2. Recent Precedent P3 Transactions

A number of P3 transactions have been completed in the US despite the financial market turmoil over the last few years. Over \$12 billion in transportation infrastructure deals have reached financial close since fall 2007. Most recently, the transit P3 market has witnessed the successful financial close of Denver's \$1.6 billion Eagle P3 project. The Denver RTD has transferred the design, build, finance, maintenance and operational responsibilities for the development of a total of approximately 35 miles of commuter light rail in and around Denver, adding connectivity between Denver International Airport and Denver Union station. The concession included responsibility for rolling stock procurement and maintenance and development of the required maintenance facility. RTD retained control over fares and service levels.

The project was awarded under an availability payment structure to a consortium including Balfour Beatty, Macquarie, Fluor, Uberior Fund and John Laing plc. The financial structure developed by the consortium included \$54 million in equity (provided by Fluor, Uberior Fund and John Laing plc) and \$397 million in Private Activity Bonds⁶, along with \$1.03 billion of FTA New Starts money under a Full Funding Grant Agreement.

The consortium will be reimbursed with construction payments of over \$1 billion during the design-build period and then paid annual service payments (availability payments) during the operations period. The availability payments have been structured over a 35 year term⁷ and are subject to deductions based on service and availability. The availability payment has been divided into two components – an operations and maintenance component which requires appropriation by the District, and a second component payable from and secured by a subordinate lien on the RTD sales tax revenues⁸.

⁶Source: InfraDeals

⁷ Source: InfraDeals

⁸RTD PAB Offering Statement

6.0 CONCLUSIONS

This analysis has identified several possible challenges and opportunities in delivering this Project under a DBFM option. These were considered against the criteria developed from program objectives defined by Metro staff:

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

In terms of challenges, there are two factors that affect both the ability to optimize the transference of risk to a private developer long term and the ability to achieve effective use of public funds. As these factors are endemic to the Project definition and to its function within the Metro operating system, it is difficult to imagine any options at this point that would minimize the risks associated with each of these factors. The short length of the Project, and the relatively small package of civil works to be maintained after construction, coupled with the strategic importance of this 1.9 mile segment to the interconnectivity of the entire Metro system, together create a risk envelope for private development that is not likely to produce a positive value for money for a full-scale P3 option.

- **Project scale:** The cost benefit of transferring a relatively small maintenance component to a private developer under a DBFM may be minimal for this small segment (1.9 miles) that has strategic importance and interconnection to the network operated by Metro. Both the cost of performance itself and the cost and difficulty in administering such a contract are likely to result in a base cost for a private developer that would be higher than Metro's for doing the same work.
- **Interface:** The interface risks for the Project will likely be increased under a DBFM approach as the private developer would have to interface with the continuous north-south and east-west routes created by the Project. It would be difficult to define a clear demarcation of maintenance responsibilities, diluting the benefit of risk transfer to Metro. Opportunity for risk transfer to a private developer is far greater where the developer is responsible for end to end service of a discrete segment of rail track or line.

In terms of opportunities, private finance offers an opportunity to potentially deliver more projects earlier in the overall Metro program for the same level of funding, depending on the outcome of legislation efforts to amend Section 54 of the Internal Revenue Code, which would enable Metro to leverage Measure R.

The DBFM approach could allow an alternative approach of either raising QTIBs or tax-exempt revenue bonds to allow Metro to leverage public funding sources such as Measure R through availability payments. The downside of using private finance is that it comes typically at a higher cost of capital – this additional cost is outweighed if

effective risk transfer to the private developer can be demonstrated in the long term. Given the challenges in this Project associated with interface risk and diseconomy of scale, effective risk transfer may prove difficult.

The reliance of the project funding plan on FTA New Starts funding is a significant risk to project schedule and cost regardless of which delivery option is selected. The project was approved into Preliminary Engineering in January 2011 at which time it is understood that the FTA noted several items of concern including the project cost estimate, the size of FTA New Starts funding included in the plan relative to other funding sources, and the implementation schedule proposed by Metro.

The analysis leads to the conclusion that, based on the limited scope of the project and its crucial location and function, a Design-Build approach for the Project under which ongoing maintenance and operations are retained by Metro appears to be the most suitable P3 approach. Under this approach Metro can benefit from risk transfer and economies of scale within the design and construction component, and Metro can maintain an economy of scale for the operations and maintenance.

An efficient variation would be to carve out non-transportation related critical elements such as elevators and escalators and perhaps even the stations themselves and procure them separately under DBM or even DBFM contracts, linking long-term performance of these easily measurable assets with compensation.

Given this recommendation, the next step would be to specifically identify those assets and their related components for which it would be best to link maintenance to construction and installation and begin developing separate performance standards for them in addition to completing preliminary engineering.