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PLANNING AND PROGRAMMING COMMITTEE
JANUARY 16, 2013

SUBJECT: PUBLIC-PRIVATE PARTNERSHIP PROGRAM, HIGH DESERT CORRIDOR

ACTION: RECEIVE AND FILE INTERIM BUSINESS PLAN AND MULTIPURPOSE CORRIDOR FEASIBILITY EVALUATION

RECOMMENDATION

Receive and file reports on a business plan to deliver the High Desert Corridor (HDC) Project as a public-private partnership (PPP) in the form of a toll concession with upfront public funding, and the feasibility of including other development opportunities and uses in the HDC.

ISSUE

The Interim Business Plan for the HDC, completed in June 2012, considered a highway facility extending 50 miles from SR-14 in Palmdale to I-15 in Victorville, estimating the likely range of public funding required to deliver this project as a public-private partnership (PPP).

The Feasibility Evaluation (Study) is to augment the HDC Interim Business Plan to assess the financial impact of adding passenger rail and other potential uses to the HDC project. The alternative incorporating other potential uses with a highway facility is referred to as the High Desert Multipurpose Corridor (HDMC).

These two reports have been prepared to evaluate the potential for a PPP delivery model and are not meant to indicate a preference for any Alternative being evaluated in the Alternatives Analysis effort currently underway.

Our initial analysis in the Interim Business Plan indicates that additional public funding in the range of $1.5 to $2.3 billion must be identified and committed to the HDC Project to cover the capital costs of the East and West Segments (approximately 40% of the 50-mile Project) not covered by toll revenue-based financing and private equity, and to

potentially subsidize the capital cost of the Central Segment. The HDMC Study concluded that the addition of high speed passenger rail service enhances the overall financial viability of the Project, provided that the assumptions indicated below are realized. Based on our analysis and factoring in the best-case assumptions, we find that combined highway toll revenues and rail fare revenues could fully finance and support a multipurpose transportation corridor between Palmdale and Victorville.

DISCUSSION

High Desert Corridor

The 50 mile HDC Project, a proposed freeway/tollway facility, is comprised of three distinct segments:

- The West Segment, extending approximately 10 miles from SR-14 to 100th Street in Palmdale;
- The Central Segment, extending approximately 31miles from 100th Street in Palmdale to US-395 in Adelanto; and
- The East Segment, extending approximately 9 miles from US-395 in Adelanto to I-15 in Victorville.
- The Project includes an option to complete the connection to SR-18 east of I-15, when public funding becomes available.

The Business Plan recommends that the construction costs of the East and West Segments be covered by public funds, delivered as a design/build project, and the facilities be operated and maintained by the California Department of Transportation (Caltrans). It further recommends that private financing under the toll concession approach be used for final design, construction, operation and maintenance (DBFOM) of the Central Segment, and that public funds supplement projected toll revenues. The sufficiency of toll revenues to finance the construction costs of all segments depends upon the robustness of toll forecasts and financing terms. All design and construction work can be undertaken by the selected concessionaire.

The analysis concluded that toll revenues would be adequate to cover some but not all of the Project's capital costs with an upfront public subsidy in the range of $1 billion to $1.8 billion (year of expenditure (YOE)) to cover the capital costs of the East and West Segments, and to potentially subsidize the capital cost of the Central Segment.

High Desert Multipurpose Corridor

The HDMC would consist of the freeway/tollway between SR-14 (Palmdale) and I-15 (Victorville) and passenger rail service between these same two cities. As indicated, the 31 mile Central Segment freeway/tollway would be operated and maintained as a toll road by a concessionaire. The passenger rail element of the HDMC would be a high-speed rail corridor (up to 150 mph) from Palmdale to Victorville, also to be operated by the concessionaire. This rail corridor would connect with a proposed privately-funded high speed passenger train proposed to be operating between Victorville and Las Vegas, called XpressWest. The HDMC would provide a critical link in interregional rail between XpressWest and the California High Speed Rail (CaHSR)

segment to be operated between Los Angeles and the Central Valley, with a stop at the Metrolink station in Palmdale.

Two basic alternatives for the HDMC, a "one-seat ride" and a "two-seat ride" between Los Angeles and Victorville, were analyzed for the Study. A one-seat ride would be a continuous high speed rail trip (minimum 150 mph) between Los Angeles and Victorville, and the two-seat ride would consist of conventional speed travel by auto or Metrolink between Los Angeles and Palmdale, and high speed rail between Palmdale and Victorville. An "enhanced" two-seat ride was also evaluated, which considered higher speed travel on an upgraded Metrolink line between Los Angeles and Palmdale, and a transfer to high speed rail at the Palmdale Metrolink station. Other ancillary corridor uses including water conveyance, electrical transmission and energy generation through wind and solar technologies were also explored. All options assume delivery through a PPP concession.

The assumptions and conclusions are as follows:

<u>One-Seat Ride</u>
Assumptions:

- Accuracy of ridership and revenue forecasts, modeled upon XpressWest rail service;
- CaHSR implements corridor track improvements between Los Angeles and Palmdale as identified in the Revised 2012 Business Plan;
- Availability of Transportation Infrastructure Finance and Innovation Act (TIIFIA) and Railroad Rehabilitation & Improvement Financing (RRIF) loans up to the statutory program maximums;
- Adequate market appetite exists for the level of equity participation required in a revenue risk, greenfield project;
- Public funding in the amount of at least $520 million YOE would be available early in project development for pre-development work, i.e., right of way acquisition, environmental clearance, construction monitoring, etc.

Conclusion:

- A multipurpose transportation corridor from Palmdale to Victorville could be self-financed and self-supporting based on combined highway toll revenues and fare revenues from rail service.

<u>Two-Seat Ride</u>
Assumptions:

- Same assumptions as one-seat ride, except no CaHSR track improvements between Los Angeles and Palmdale;
- Rail fare revenues from Metrolink service are less robust;

Conclusion:

- Fare revenues would be sufficient to cover operations & maintenance and lifecycle costs during operations, but insufficient to finance capital costs;
- Public funding subsidy of $1.5 billion ($900 million for the rail component and $607 million for the HDC highway only) would be required for the multipurpose corridor.
- Even though public subsidy is increased, high speed rail service would still be delivered at a lower overall cost than a stand-alone, publicly-funded project.

Enhanced Two-Seat Ride

Assumptions:

- Same assumptions as one-seat ride;
- High speed travel between Los Angeles and Palmdale and between Palmdale and Victorville, forcing a transfer at Palmdale.

Conclusion:

- Fare revenues appear sufficient to cover all costs, and contributes a bit less than $100 million to fund the highway gap;
- Public funding subsidy of $525 million would be required for the multipurpose corridor.

Several other potential uses for the corridor relating to energy and water generation and/or use were evaluated. The uses considered and Study conclusions are as follows:

Water

- The Mojave groundwater basin and aquifer are in the vicinity of the corridor, but conveyance of the water to the Coast was determined not feasible, as the California Aqueduct is sufficient to meet the water demands of Southern California at this time, and Metropolitan Water District has future plans to increase capacity.

Wind Energy

- The total initial investment in infrastructure would exceed any financial benefits that could be derived from energy generation.

Solar Energy

- Solar energy developed from 100 acres of land within the corridor could be sufficient to power all electrical needs of the HDMC, including the trains, resulting in a "net-zero" energy facility.

Compressed Natural Gas (CNG) Refueling Stations

- Selling rights to CNG refueling stations along the corridor could be a viable source of revenue, though not a significant financial contributor to the project.

Transmission Line Infrastructure

- A few opportunities exist to generate revenue through the construction of transmission lines, though not a significant financial contributor to the project.

In summary, installing a solar array system along the corridor with or without the use of transmission line infrastructure is potentially cost effective based on current analysis. It has the potential to power the high-speed trains as well as all the power needs of the highway, and do so at a lower cost than purchasing power through existing sources.

NEXT STEPS

A new "High Speed Rail Feeder Service" alternative has been added to the Freeway and the Freeway/Tollway alternatives currently being studied in the EIS/EIR for the HDC. We anticipate completion of the Draft EIR/EIS in the fall of 2013, and the Record of Decision in the late summer of 2014.

The Study results demonstrate that the development of a complete business case is warranted, assuming that XpressWest achieves it's financing and proceeds with construction. The business case should include an evaluation and recommendation regarding the governance structure for the corridor and procurement strategy.

We will return to the Board for adoption of a locally preferred alternative, and request for authorization to proceed with the HDMC as a PPP project, as appropriate, when sufficient public funding has been identified to proceed.

ATTACHMENTS

A. High Desert Corridor Project Interim Business Plan, August 2012
B. Public-Private Partnership Feasibility Evaluation, High Desert Multipurpose Corridor, December 2012

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ATTACHMENT A

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

Public-Private Partnership Program

High Desert Corridor Project
Interim Business Plan

Prepared by
INFRACONSULT LLC

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

August 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.

Subsequent to the acquisition of Halcrow, Inc. by CH2M Hill in November, 2011, the company has withdrawn from the project. Work completed by Halcrow prior to November, 2011 is included in this document.

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EXECUTIVE SUMMARY

This document presents an Interim Business Plan to deliver the 50-mile High Desert Corridor Project ("HDC" or "Project") as a Public-Private Partnership ("P3") in the form of a toll concession with up-front public funding. This project delivery approach builds upon the finding and recommendations of the Strategic Assessment conducted in Task 3. It further reflects the distinct demographic characteristics of the Project area, with greater urbanization on the west and east and opportunities for development in the Central Segment.

Project Definition

Extending 50 miles between State Route 14 ("SR-14") in Palmdale and Interstate 15 ("I-15") in Victor Valley,[1] the HDC Project is comprised of three distinct segments:

- The West Segment, extending approximately 10 miles, from SR-14 to 100th Street in Palmdale;
- The Central Segment, extending approximately 31 miles, from 100th Street in Palmdale to US 395 in Adelanto; and
- The East Segment, extending approximately 9 miles, from US 395 in Adelanto to I-15 in Victorville.

The implementation approach recommended in this Interim Business Plan calls for tolling on the Central Segment with delivery of all three segments under a single P3 contract. In support of this recommended approach, the financial analysis in this document focuses on determining the range of public subsidy needed to advance the entire Project as a single toll concession.

As proposed, the HDC Project will be funded and operated as follows:

- Public funds would be used for acquisition of right–of-way ("ROW")for the whole Project;
- Public funds would be used to cover the costs of final design and construction of the interchanges and connections in the suburbanized areas at both ends;
- Private financing under the toll concession approach would be used for the final design, construction, operation and maintenance of the Central Segment of the Project;
- The East Segment and the West Segment would be turned over to the California Department of Transportation ("Caltrans") for operation and maintenance, while the Central Segment would remain in the concession to be operated and maintained as a toll road for the duration of the concession; and
- Public funds would be used to supplement projected toll revenues for the construction of all three segments, with the level of public funding ultimately to be determined through the Project procurement process.

[1] With an option to complete the connection to SR 18 East of I-15 when public funding becomes available.

With this project delivery approach, the final design, construction, operation and maintenance for a major portion of the Project, approximately 30 miles of the 50-mile corridor, will be funded and financed largely through tolls. As summarized further below, depending upon the robustness of toll forecasts and financing terms, tolls could potentially fund a portion of the cost of the East and West Segments as well.

Interim Business Plan: Refinement of the Strategic Assessment

The Strategic Assessment that preceded the Interim Business Plan proposed implementing the Project with private sector involvement in the design, construction, finance, operation and maintenance ("DBFOM") of the Central Segment as a tolled section; and with design-build procurement for the East and West Segments. It also considered additional alternatives for development and implementation of the Project covering the full spectrum of risk transfer from:

- A publicly funded traditional design-bid-build ("DBB") delivery, possibly with tolls to reduce the amount of public funding needed; to
- A design-build-finance-operate-maintain ("DBFOM") P3 delivery option with the full 50-mile length of the Project tolled.

The Strategic Assessment concluded that a DBFOM delivery option provides the best opportunity to expedite project delivery, reduce project cost, maximize capital for construction, and minimize public funding through the use of toll revenues. It further recommended that, subject to further analysis, excluding tolls on the East and West Segments and instead providing a revenue stream to the concessionaire through tolling on the Central Segment would be the optimal P3 structure, reinforcing both political momentum and public support for the Project.

This Interim Business Plan builds on the recommended P3 Alternative using refined data developed for the Project environmental documents currently in preparation, refined capital cost estimates, and refined tolling analyses. Specifically, these refinements include:

- **EIR/EIS Documents in Preparation:** Environmental studies are currently underway to select the preferred alternative and develop an Environmental Impact Report/ Environmental Impact Statement ("EIR/EIS") for the Project. The range of Build alternatives includes a "Freeway/Tollway Alternative" with tolls on the Central Segment. At the time of the Strategic Assessment, such alternatives were not yet defined. While the Interim Business Plan considers this alternative, it does not presume to prejudge the outcome of the environmental process; rather, the objective is to provide a baseline for the assessment of the viability of delivering the ultimately-selected alternative through a P3.
- **Updated Capital Costs:** Construction costs prepared by the P3advisory team InfraConsult LLC, ("Advisory Team") have been confirmed with Caltrans PA&ED documents prepared for the West, Central, and East Segments. Preliminary design, and ROW and construction cost estimates developed by Caltrans for the Project are still in progress and should be available by the end of September 2012. The Interim Business Plan is based on preliminary cost estimates prepared by Caltrans and the City of Victorville in 2010 for the West and East Segments respectively (see below), and from the Advisory Team's own cost estimates based on those previous studies for the Central Segment. Preliminary cost estimates currently under preparation by Caltrans for the Central Segment concur with the Consultant Team's estimates. West and East Segment cost estimates have already been defined.

- **Refined Toll Revenue Forecasts:** The revenue estimates used for the Strategic Assessment were done at a conceptual level and were based on freeway traffic forecasts using a generic diversion rate. They did not consider many of the most important variables that enter into the decision making process of users of the corridor. The extensive forecasting effort conducted over the past 12 months for the EIR/EIS and the P3 evaluation take into account detailed land use and socio-economic data including results from the 2010 census, as well as parameters specific to user choices of route. These include electronic toll collection, value of time savings, the safety and reliability of travel time offered by the toll highway, and actual Southern California data on similarly structured toll facilities. In summary, the Interim Business Plan relies on a more accurate and reliable estimate of annual revenues that would be achieved with completion of the Project, assuming an all-electronic toll ("AET") collection system.

This Business Plan is still preliminary and therefore labeled an Interim Business Plan for several reasons:

- While the Freeway /Tollway Alternative considered in this document may include reservation of ROW for a possible future High Speed Rail ("HSR") connection between Palmdale and Victor Valley, a recent development added a new "High Speed Rail Feeder Service" to the Freeway and Freeway/Tollway alternatives. The rail component would include not only ROW reservation but a rail passenger service connecting the existing and future rail services in Antelope Valley (improved Metrolink and future California high speed rail ("CAHSR") with Victor Valley and the proposed "Xpress West" (formerly DesertXpress) line to Las Vegas. The economic feasibility of this new component is being analyzed in a separate report to be submitted to Metro in August 2012. Addition of the new alternative will extend the time for completion of the Draft EIR/EIS by one year, to the summer of 2013, and the Record of Decision ("ROD") to the summer of 2014.

- The data developed to date for the Freeway/Tollway Alternative does include a comprehensive Traffic and Revenue Study with updated forecasts for both the Freeway and Freeway/Tollway Alternatives. However, the Final Traffic Report including Freeway/Tollway traffic and rail ridership forecasts for the new alternative are only expected in March 2013.

Financial Inputs to the Interim Business Plan

- **Project Costs.** Based on most recent estimates, the capital cost of the HDC Project is $2,244 million in 2011dollars and $2,852 million year of expenditure ("YOE") escalated to reflect construction over the FY 2014 – FY 2019 period. Of this total, the capital costs of the individual segments are as follows:

Table S.1 – High Desert Corridor Project Capital Costs

(in millions)	West Segment	Central Segment	East Segment	Total
Total Capital Costs (2011 $)	600	1,074	560	2,234
Total Capital Costs (YOE $)	750	1,402	700	2,852

Annual Operations and Maintenance costs for the Central Segment as a toll facility are estimated to be $10.6 million (2011$), with cost of major rehabilitation estimated to average $6.9 million per year (2011$).

- **Currently Available Public Funding:** Metro has programmed a total of $33.0 million YOE through the Measure R program for environmental and design work to be undertaken through FY 2013. Federal earmarks secured over the prior decade in the amount of $16.75 million have also been obligated to other Project partners, including San Bernardino County, the Town of Apple Valley, and the High Desert Corridor Joint Powers Authority ("Partner Agencies"), and committed to the Project. The combined total of Measure R and federal earmarks represent approximately $50.0 million in programmed and available funding. This amount is expected to be adequate to complete the preliminary design and the environmental documents.

  Capital funding necessary for the final design and construction of the project has not yet been programmed by Metro or Partner Agencies. San Bernardino County's Measure I Strategic Plan identifies $213.0 million in anticipated funding for highway projects within the Victor Valley subarea through its Major Local Highways ("MLH") Program. Of this amount, SANBAG staff estimates that $16.0 to $27.7 million may be available for the portions of High Desert Corridor located in San Bernardino County over the life of Measure I (2010-2040) after FY 2020.

- **Project Revenues.** From the refined toll forecasts prepared for the Highway/Tollway alternative, "low" and "high" toll revenue forecasts were used to determine a range of public funding that would potentially be required to supplement toll revenues for implementation of the Project. These forecasts are shown below. The totals reflect the cumulative toll revenue collected over a 50-year toll concession period (from the start of operations in FY 2020 through FY 2064). As described below, these forecasts were then inputted into the project financing scenarios developed as part of the Interim Business Plan.

Table S.2 – Range of Toll Revenues for the High Desert Corridor Project: Central Segment

(in millions)	Low Revenue Forecast	High Revenue Forecast
Toll Revenues (2011 $)	4,773	5,857
Toll Revenues (YOE $)	14,105	17,436

Conceptual Financing Structure for the HDC Project

The financial structure assumed in the Interim Business Plan is based on the reasonable estimates of project costs and reasonable range of project revenues described above, and the key components of a potential financial structure that may be proposed by consortia competing for the Project toll concession. This structure could include a combination of toll revenue-based financing instruments including a Transportation Infrastructure Finance and Innovation Act ("TIFIA") loan through US DOT affording favorable interest rates and flexible repayment terms, Private Activity Bonds ("PABs") providing tax-exempt debt at lower rates of interest, and private equity.

To estimate the potential range of public funding required to supplement toll revenue-based financing and private equity, assumptions were made based on current market conditions about the ratio of debt to equity, return on equity, debt sources and debt service cost, tax

structure, and the length of the concession contract. Detailed financial modeling was then performed to assess the net project cost to Metro under the two revenue scenarios:

- Low Revenue Scenario 1: assuming "conservative" financing costs and no TIFIA loan
- High Revenue Scenario 2; assuming lower financing costs and a TIFIA subordinated loan.

The analysis summarized in Table S.3 concluded that there is a strong likelihood that the public contribution required by the best value proposer for the construction of the Project will fall within a range of $960 million to $1.8 billion YOE for a low subsidy and high subsidy scenario, respectively. The low public subsidy scenario would require a higher toll revenue forecast and lower financing costs with TIFIA, and the higher public subsidy scenario would result from a lower toll revenue forecast and no TIFIA financing.

Table S.3 – Sources and Uses of Funds for Pre-Development & Construction of the High Desert Corridor (2012-2019), Millions, YOE $

Sources of Funds	High Subsidy / Low Toll Forecast	Low Subsidy / High Toll Forecast
Public funds for Metro retained costs	520	520
Construction subsidy	1,759	959
Total Public Funds	***2,279***	***1,479***
Private Activity Bonds (PAB)	523	663
TIFIA Loan	N/A	637
Private Equity	224	325
Total Private Financing	***747***	***1,625***
Net revenue and interest	3	3
Total Sources of Funds	**3,029**	**3,107**
Uses of Funds	**High Subsidy / Low Toll Forecast**	**Low Subsidy / High Toll Forecast**
Total Metro retained costs for pre-development, ROW, and construction monitoring	520	520
Construction costs	2,332	2,332
Financing costs	159	234
Net transfers to reserve accounts	18	21
Total Uses of funds	**3,029**	**3,107**

In addition, Metro-retained costs for pre-development, ROW, and construction supervision are estimated at $520 million YOE. Hence total public funding needed for the Project ranges from $1.5 to $2.3 billion.

Tolling of the Central Segment provides a private financing capacity for the Project that could range from approximately $750 million to $1.6 billion, depending largely on the robustness of the toll revenue forecasts. The higher capacity level assumes the use of PABs and TIFIA, supplemented by a private equity contribution.

As the cost of the Central Segment is estimated at $1.4 billion YOE, the High Subsidy / Low Toll Forecast Scenario would require public funding to supplement toll revenue-backed financing for the Central Segment in addition to full public funding for the West and East Segments. By contrast, under the Low Subsidy / High Toll Forecast Scenario, toll revenue-backed financing would cover the cost of the Central Segment and provide approximately $200 million that could be applied toward the cost of the other segments.

It should be noted that proposers will ultimately be generating their own toll revenue forecasts and estimates of Project costs. While the Advisory Team is confident that the financing assumptions used in the Interim Business Plan are consistent with market conditions, the level of market appetite for revenue risk on this Project may warrant an availability payment structure instead of a toll concession structure with an upfront construction subsidy, as assumed in this analysis. A determination will be made in the Final Business Plan as to the optimal financial structure.

Conclusion and Next Steps

The evaluation presented in this Interim Business Plan leads to the following principal conclusion:

> ***Additional public funding in the range of $1.5 to $2.3 billion must be identified and committed to the High Desert Corridor Project to cover the capital costs of the East and West Segments (approximately 18 miles or 40% of the 50-mile Project) not covered by toll revenue-based financing and private equity and to potentially subsidize the capital cost of the Central Segment. The Project will likely be successful in attracting several consortia to bid competitively for the toll concession, resulting in the lowest amount of public funding required to build, operate, and maintain the Project compared to other delivery options initially defined in the Strategic Assessment.***

If and when such public funding is committed to make this a financially viable Project, a P3 concessionaire could utilize financing capacity out of the projected future toll revenue stream to minimize the amount of upfront public funding needed. The proposed toll concession approach could deliver the Project several years earlier than currently scheduled in the 2009 Long Range Transportation Plan ("LRTP") and at a cost to Metro less than that estimated in the Measure R Program. To advance the Project, it is essential that Metro and its public agency partners identify and secure the $1.5 to $2.3 billion in public funding required. These amounts could be further reduced under the new MAP21 legislation passed by Congress, which substantially enhance the TIFIA loan provisions.

In the meantime, the Project EIR/EIS is currently considering a "High Speed Rail Feeder Service" alternative that would combine the current freeway or freeway / tollway elements with a rail passenger service between Palmdale and Victor Valley. The potentially positive effect of a multimodal corridor on the demographic and socio-economic development of the High Desert region still needs to be analyzed in greater detail. It is likely that the accessibility and mobility benefits of the rail component and their effect on the total number of trips in the corridor could

more than offset the expected modal shift from highways to high speed rail and the potential traffic diversion due to tolls on the Central Segment and thereby enhance the overall financial feasibility of the High Desert Corridor.

As the HDC moves through the project development process, assuming that significant progress is made in identifying additional public funding, and a P3 delivery option is ultimately selected and approved by the Metro Board and other stakeholders, Metro will conduct industry outreach and coordinate with Caltrans and the California Transportation Commission ("CTC").

1.0 PURPOSE OF THIS BUSINESS PLAN

The purpose of this Interim Business plan is to estimate the likely range of additional public funding needed for the High Desert Corridor Project ("HDC" or "Project") assuming that the Project is delivered as a Public-Private Partnership ("P3") and to recommend next steps in the procurement process.

Building upon the findings of the Strategic Assessment (Task 3), this Interim Business Plan analyzes a toll concession with an upfront construction subsidy as a conceptual financing structure for the Project.

The P3 advisor, InfraConsult LLC ("Advisory Team"), is confident that the financing assumptions used in the Interim Business Plan are consistent with market conditions. That said, the level of market appetite for revenue risk on this Project may warrant an availability payment structure instead of a toll concession structure with an upfront construction subsidy.

The Final Business Plan will make a final determination as to the optimal financial structure.

1.1. Delivery Options Considered

Three possible P3 approaches to build the Project from SR-14 to I-15 were initially considered in the Strategic Assessment:

- Design-Build-Finance-Operate-Maintain ("DBFOM") either for the entire Project or for the most financially feasible portion of the Project. Traffic revenue risk under this scenario could: a) fall entirely to the concessionaire; b) be shared between Metro and the concessionaire; or c) fall entirely to Metro who would compensate the concessionaire through an Availability Payment ("AP") structure.

- Design-Build ("DB") for the two end connections of the Project (SR-14 and I-15), where tolling would be impractical or insufficient to fund a substantial portion of the initial capital cost. The public sector would be responsible for operations and maintenance upon completion of construction.

- Pre-Development Agreement ("PDA"), with early involvement by the concessionaire in the design and development of the Project. The public sector would retain responsibility for environmental studies and obtaining a Record of Decision ("ROD"), but prior to the ROD, the concessionaire would be selected and subject to cost rates, with final price negotiated after the ROD.

The Strategic Assessment considered each delivery option for the Project against the following evaluation criteria, developed from program objectives defined by Metro staff:

- **Accelerate project delivery.** Significant support exists to advance the delivery of Measure R projects to the extent that funds generated by Measure R and other financial resources can support such acceleration. In its policy statements, Metro has emphasized the importance of schedule adherence for delivery of Measure R projects, both for financial and public acceptability reasons. The delivery of projects on time enhances credibility with the public and promotes better budget management and planning.

- **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 employing delivery options other than conventional utilization of design-bid-build, Metro is better able to leverage public sector funds and resources, achieve budget certainty, and thus optimize the use of taxpayer dollars. Public-private partnerships, structured appropriately, support the achievement of this objective.

- **Optimize risk transfer.** As the project sponsor, Metro typically retains responsibility for all risks related to right-of-way acquisition, permitting, environmental clearance, tort liability and public acceptability. Where P3 is used for project delivery, a concessionaire shares or assumes a significant number of risks related to project delivery and performance that Metro would otherwise manage. A project's risk profile can be "optimized" by allocating a particular risk to the party best able to manage it. The potential cost of the risk transferred is embedded in the bid price through rigorous competition.

- **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 method, Metro has identified a key objective to have quality of service match the same high performance standards that Metro already offers.

The DB option would transfer key design and construction risks to the concessionaire and as such would likely lower the capital costs of the Project compared to a traditional Design-Bid-Build ("DBB") delivery; however, it would not achieve lifecycle efficiencies associated with the long-term operations and maintenance of the Project. Most critically, this option was not evaluated further as it would not provide any additional financing capacity or private equity investment through the leveraging of toll revenues. Given the lack of upfront available public funding for the Project, such investment was deemed essential to implementation.

The PDA option also merited consideration by the Advisory Team, as it would shorten the amount of time spent on design between the ROD and the start of construction and hence accelerate project delivery, one of the key Metro program objectives. However, as Metro and Caltrans had already initiated the Project Approval and Environmental Document ("PA&ED") process, the Advisory Team concluded that the negotiation of a PDA with a private developer at this stage would disrupt and delay the environmental process. Therefore, this delivery option was not evaluated further either.

This assessment concluded that the DBFOM option would provide an optimal delivery option, specifically because of its potential to minimize the requirement for public funds through private toll revenue-based financing and equity contributions. Project acceleration was also a key consideration in the selection of DBFOM as a preferred delivery option, as the Project would be fully completed in FY 2020 compared to FY 2029 as envisaged in Metro's Long Range Transportation Plan ("LRTP").

2.0 PROJECT DEFINITION

2.1. Background and Scope

The High Desert region in northern Los Angeles and San Bernardino Counties has been one of the fastest growing areas in California. Several major studies have been carried out in recent years to identify necessary transportation infrastructure improvements:

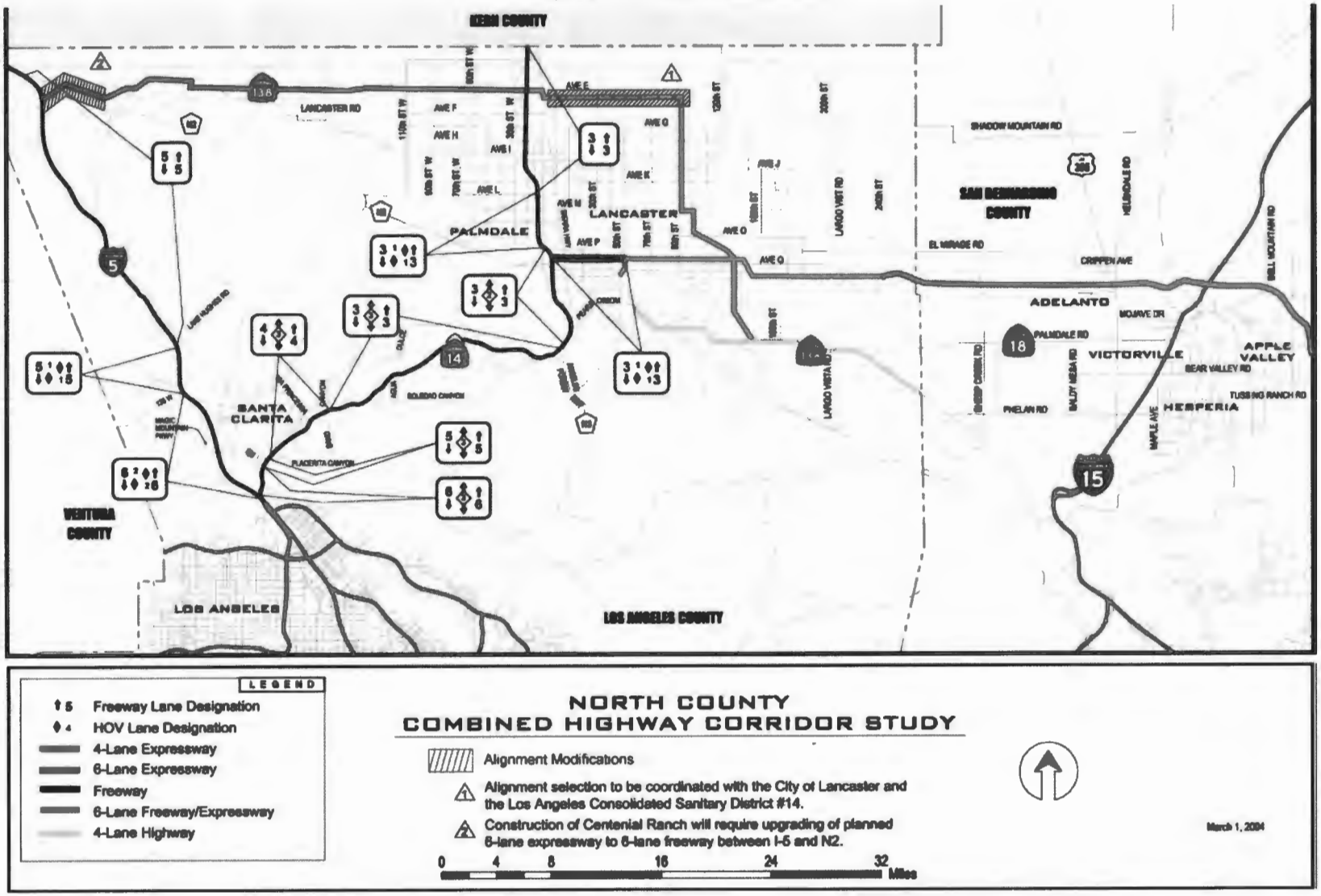
- The Regionally Significant Transportation Investment Study ("RSTIS") for the High Desert Corridor, completed in April 2002, adopted as the Locally Preferred Alternative ("LPA") the East-West corridor from SR-14 in the vicinity of Palmdale to I-15 in the vicinity of Victorville depicted in this report.

- Simultaneously, the North County Combined Highway Corridor Study developed a multi-modal transportation plan for the northern portion of Los Angeles County, addressing both short-term (2010) and long-term (2025) requirements for personal travel and goods movement.

For approximately two and a half years, a Technical Advisory Committee ("TAC"), composed of representatives of the sponsoring agencies (Southern California Association of Governments ("SCAG"), San Bernardino Association of Governments ("SANBAG"), Metro, the Counties of Los Angeles and San Bernardino, the Cities of Palmdale, Lancaster, Adelanto, Hesperia and Victorville, and the Town of Apple Valley, the California Department of Transportation ("Caltrans"), Federal Highway Administration ("FHWA"), and the Federal Transit Administration ("FTA"), met monthly to review progress of the Study. The North County Transportation Coalition, composed of elected officials from Los Angeles County and north county cities, provided policy oversight for the study.

The North County Combined Highway Corridor Study concluded: "The east-west segment between SR-14 and I-15 would be an 8-lane freeway (including a High Occupancy Vehicle("HOV") lane in each direction) from SR-14 past the Palmdale Airport to 50th Street East along an alignment paralleling P-8 in Palmdale; a 6-lane freeway/expressway from 50th Street East to 240th Street East; and a 4/6-lane expressway from 240th Street East past the planned Southern California Logistics Airport to I-15 and beyond. This new east-west route is the backbone of the proposed HDC, and will accommodate an expected three to six fold increase in traffic between the Antelope and Victor Valleys. It will provide a new level of intra-valley accessibility and carry truck and other through traffic safely around existing communities."

Figure 1 – Project Location



The same report recognized that "current constraints on existing tax revenue sources make conventional financing of a new High Desert Corridor highway in Los Angeles County very challenging," and envisioned toll revenue financing as a possible source of funds in combination with local funds and federal grants.

Enacted in August 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users ("SAFETEA-LU," Section 1305) designated the High Desert Corridor/E220 from Los Angeles to Las Vegas via Palmdale and Victorville as a National High Priority Corridor on the National Highway System.

In November 2006, the County of Los Angeles and the County of San Bernardino formed the High Desert Corridor Joint Powers Authority ("HDCJPA") to pursue funding and expedite the planning, design, construction, financing, operation and maintenance of this corridor.

2.2. Environmental Impact and Process

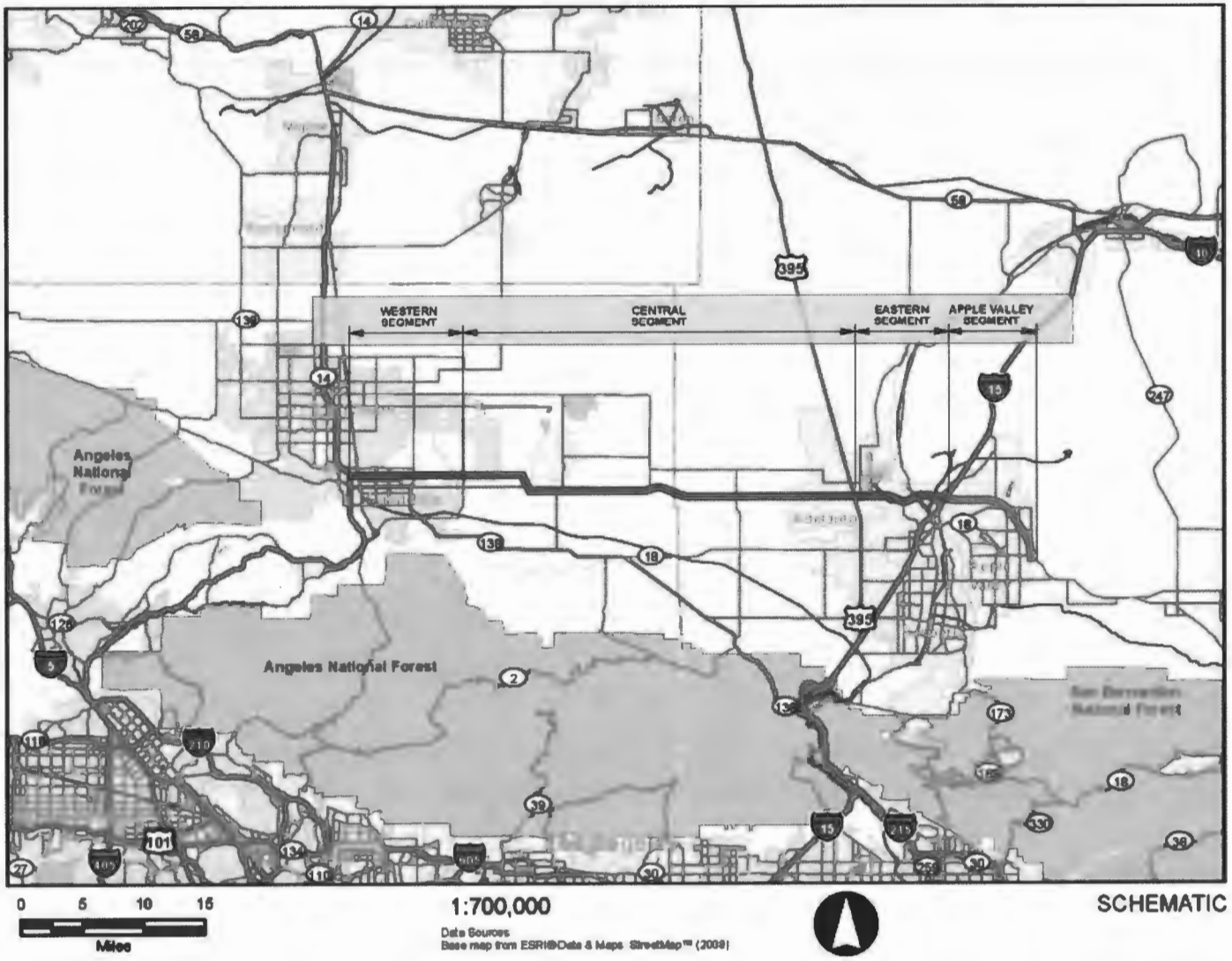
PA&ED preparation studies were initiated for the East and West Segments of the Project in 2007 (Refer to Figure 2):

- **West Segment SR-14 to 100th Street (10 miles):** Caltrans District 7 initiated Technical Studies for this segment under the original HDC Project Study Report (Project Development Study) ("PSR(PDS)"). In May 2010, the HDCJPA, Caltrans and Metro jointly expanded the scope of the PA&ED to the entire HDC Corridor from SR-14 to I-15 (50 miles) and its connection to SR-18 east of Apple Valley (see below).

- **East Segment US-395 to I-15 (9 miles):** The City of Victorville received federal funds to develop a portion of the HDC from US-395 to I-15 including a major interchange with I-15 and a 13-mile connection to SR-18 east of Apple Valley as a standalone "Phase 1 of the HDC." Studies completed by the City of Victorville were subsequently incorporated in the combined PA&ED.

- **Central Segment 100th Street to US-395 (31 miles):** Caltrans District 7 initiated mapping and biological surveys in Spring 2010.

Figure 2 – High Desert Corridor Segments



A new PA&ED Scope of Work and a Partnership Agreement were negotiated between the sponsoring agencies and Caltrans Districts 7 and 8, in order to combine all studies undertaken, include both freeway/expressway and freeway/tollway alternatives and consider ROW reservation for a future High Speed Rail between Palmdale and Victorville, with the objective of completing the environmental document and obtaining project approval by the end of 2012.

In February 2012, the scope for the Project was expanded to include an additional alternative with not only ROW reservation but a fully operational rail passenger service between Palmdale and Victor Valley to form the High Desert Multimodal Corridor ("HDMC," of which the freeway/expressway or the freeway/tollway would be a component).

The resulting Draft Environmental Impact Report / Environmental Impact Statement ("EIR/EIS")is anticipated to result in identification of a locally preferred alternative in the third quarter of 2013 and a record of decision in the second quarter of 2014.

As mentioned above, the Interim Business Plan is only addressing the delivery of the freeway/tollway alternative with reservation of right-of-way ("ROW") for future High Speed Rail, but is not evaluating the costs, benefits and delivery of a rail service in the corridor. While the Interim Business Plan considers this alternative, it does not presume to prejudge the outcome of the environmental process; rather, the objective is to provide a baseline for the assessment of the viability of delivering the ultimately-selected alternative through a P3.

2.3. Capital Costs

Capital costs for the Project have been estimated based on Caltrans data assuming a single design-build construction contract for the three segments. These estimates are documented in Appendix A and summarized as follows (in 2011 dollars and year of expenditure ("YOE")):

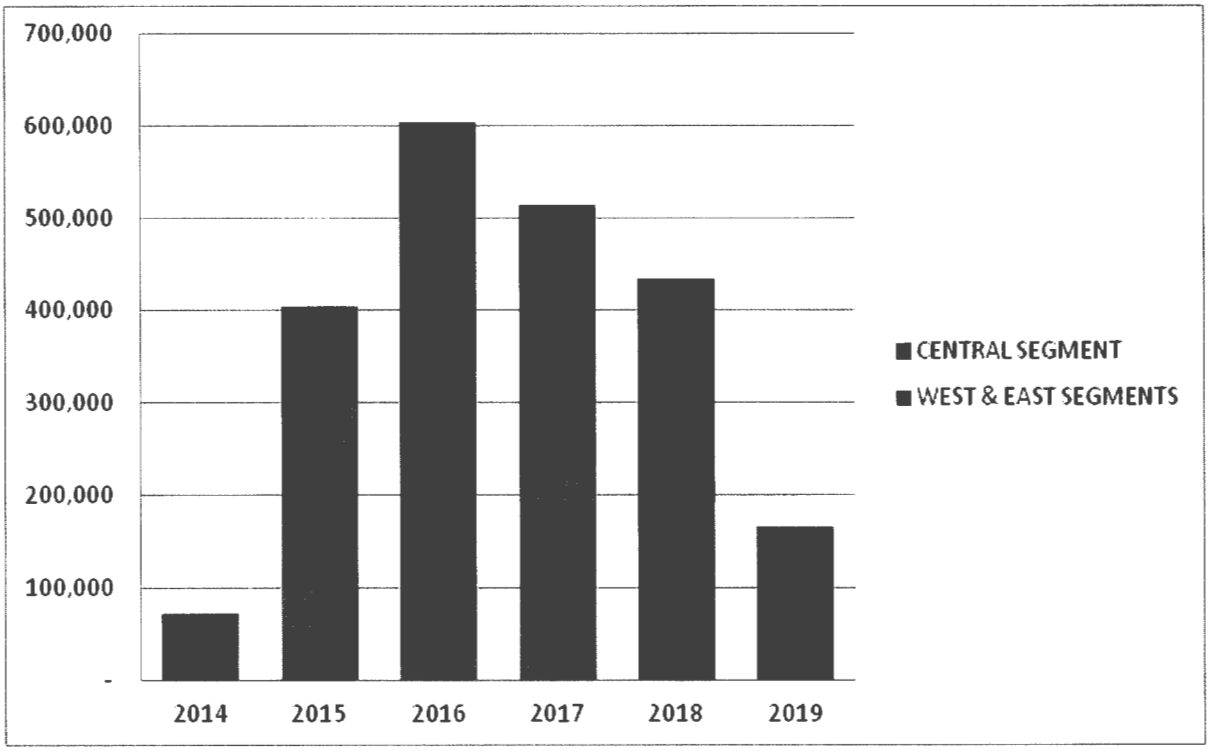
Table 1 – Capital Costs Summary (Millions, 2011 $)

Item Description		West Segment	Central Segment	East Segment	Total
1	Design, management, surveys	37	66	35	138
2	Construction monitoring	19	32	18	69
3	Environmental mitigation	18	37	24	79
4	Roadway (including utilities)	277	707	311	1,295
5	Structures	158	42	105	305
6	Toll Collection Systems	-	23	-	23
7	Land Costs / Right-of-way	91	167	67	325
	Total Costs (2011 $)	**600**	**1,074**	**560**	**2,234**
	Total Costs (YOE$)	**750**	**1,402**	**700**	**2,852**

Note: ROW, utilities relocation and structures cost estimates for the Central Segment were received from Caltrans after the Financial Analysis was completed, which would potentially reduce Metro retained costs by some 60M$, but would not materially change the conclusions of the analysis.

Figure 3 below presents the cash flow profile for the capital expenditure for the Project from mid-2014 (ROD) to completion of construction (end 2019).

Figure 3 – Cost Profile of the Best Estimate (2011 $)

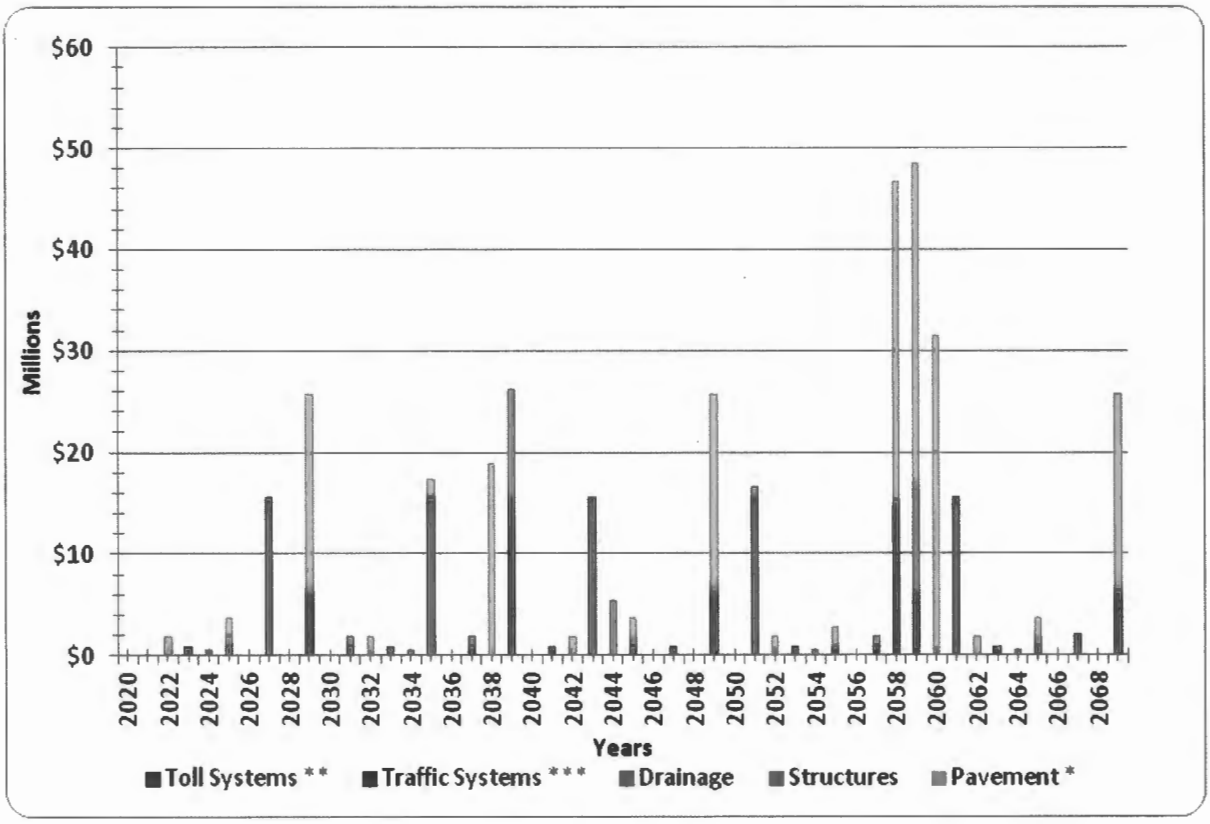


2.4. Operations and Maintenance (O&M) and Lifecycle Costs

Operations and Maintenance ("O&M") costs were estimated for the tolled Central Segment only under a P3 delivery, as the East and West Segments are assumed to be turned over to Caltrans at the completion of construction. Routine O&M costs for the Central Segment are anticipated to be approximately $10.6 million per year (2011 dollars), escalating at a rate of 3.0 percent (reflective of Consumer Price Index ("CPI") and long-term growth in traffic volumes). Due to the anticipated opening of the East and West Segments one year ahead of the Central Segment, and assumed pent-up demand for the new connection between the Antelope and Victor Valleys opening in 2020, full ramp-up is projected to occur in the third year of operations (2022).

The annualized lifecycle costs (preventive maintenance, replacement, plus major rehabilitation costs) average $6.9 million (2011 dollars) per year, or approximately $340 million over a 45-year operating period (2020-2064 after a 5-year construction period). Figure 4 below shows the schedule and cost associated with the major rehabilitation of the Project components, with a spike for major pavement rehabilitation work spread over three years (2058-2060).

Figure 4 – Schedule of Lifecycle Costs (2011 $)



2.5. Public Funding

For the capital costs of the project, Metro has programmed a total of $33.0 million YOE through the Measure R program for environmental and design work to be undertaken through FY 2013. Federal earmarks secured over the prior decade in the amount of $16.75 million have also been obligated to other Project partners, including San Bernardino County, the Town of Apple Valley, and the HDCJPA. These funds are available for all phases of the project, with some restrictions imposed on their use for the design and study of Project segments within specified geographical limits.

The combined total of Measure R and federal earmarks represent approximately $50.0 million in programmed and available funding. This amount is expected to be adequate to complete the preliminary design and the environmental documents.

Capital funding necessary for the final design and construction of the Project has not yet been programmed by Metro or the Partner Agencies. Metro has identified $3,031.0 million in "highway strategy" revenues that would come from other future potential sources, including tolls/public-private partnership investment, state programs, and various federal formula, earmarks, and grant programs.

Similarly, San Bernardino County's Measure I Strategic Plan identifies $213.0 million in anticipated funding for highway projects within the Victor Valley subarea through its Major Local Highways

("MLH") Program. Of this amount, SANBAG staff estimates that $16.0 to $27.7 million may be available for the portions of the HDC located in San Bernardino County over the life of Measure I (2010-2040).

Released in January 2012, SANBAG's 10-Year Delivery Plan for Measure I Projects covering the period from FY 2010 through FY 2020 does not allocate any MLH funds to the HDC. Hence, any revenues from Measure I for the Project are not anticipated to be available until after FY 2020. The timing of these funds thus creates a mismatch with the proposed implementation schedule outlined in Section 2.7.

The sources and levels of programmed and/or anticipated funding for the Project are summarized in Tables 2 and 3.

Table 2 – Summary of Public Funding Sources

Source	Funding Level ($ Million)
Local	
Measure R	33.0
Measure I	16.0-27.7
Federal	
Earmarks (TEA-21, SAFETEA-LU)	16.8
TOTAL	**65.8-77.5**

Source: LACMTA Financing Forecasting Model, November 10, 2011; SANBAG Measure I Strategic Plan Part I, April 2009; Conversation with SANBAG staff, July 2010

Table 3 – Annual Levels of Programmed Funding ($ Million)

Source	Total	Prior	FY 2010	FY 2011	FY 2012	FY 2013	…	FY 2021-2040
Local								
Measure R	33.0		0.3	12.5	11.5	8.8		
Measure I	16.0-27.7							16.0-27.7
Federal								
Earmarks	16.8	16.8						
TOTAL	**65.8-77.5**							

The assumption in this Business Plan is that the Project would be constructed beginning in 2015 with completion by the end of 2019 (FY 2020) and toll revenue operations anticipated to begin in 2020.

Public funds would need to be made available starting in FY 2015 after the publication of the ROD through FY 2019 for milestone payments and to facilitate final design, acquisition of right-of-way, and other pre-construction activities for the East and West Segments.

The public contribution for the Central Segment, if any,(or a potential reimbursement of public funding by the toll concessionaire in a high toll revenue scenario)would only start after

completion of the full project and opening of the connection between SR-14 and I-15(see Chapter 3 Interim Analysis for an estimate of a High Subsidy and Low Subsidy range).

2.6. Tolling

Given the lack of available and/or committed public funding, the delivery of the Project relies on the tolling of the Central Segment. Low and high toll revenue forecasts were developed for the Project based on traffic and revenue projections by Parsons Corporation[2] ("Parsons"). Table4summarizes the total toll revenue projected for the entire analysis period assuming that toll operations would begin in FY 2020. Additional information on traffic and revenue forecasting methodology and toll rate assumptions is presented in Appendix B "Traffic and Revenue Forecasts," and a concept of operations can be found in Appendix C.

Table 4 – TollRevenue(2020-2064)

(in millions)	2011$	YOE $
Toll Revenue (low forecast)		
Auto toll revenue	3,840	11,348
Truck toll revenue	933	2,757
Total Toll Revenue	**4,773**	**14,105**
Toll Revenue (high forecast)		
Auto toll revenue	4,393	13,077
Truck toll revenue	1,464	4,359
Total Toll Revenue	**5,857**	**17,436**

2.7. Implementation Schedule

Caltrans' current PA&ED schedule for the Project was recently revised due to the addition of "rail passenger service between Palmdale and Victorville." It adds nine months to the circulation of the draft EIR/EIS and one year to the PA/ED final approval and the signature of the ROD and is summarized as follows:

Milestone/Items/Action	Project Dates
Begin Work	08/2010
Initiate Public Scoping	10/2010
Prepare Draft Technical Studies	08/2010 - 06/2013
Draft EIR/EIS Circulation	Summer 2013
Public Hearings	10/2013
Respond to Comments/Complete Final EIR/EIS	12/2013 – 03/2014

[2] Caltrans High Desert Corridor-New State Route 138; Draft Traffic Study Chapter 3, May 2012; Parsons

Caltrans signs Final EIR/EIS	04/2014
Caltrans Signs ROD and files NOD	06/2014

For the purposes of this report, the schedule for implementation of the Project assuming the circulation of the draft EIR/EIS in the summer of 2014 is as shown in Table 5 below for the P3 delivery compared with a traditional DBB procurement.

Table 5 – Key Milestone Dates

Activity	P3 Combined DB/DBFOM Delivery	Traditional DBB Procurement
Draft EIR/EIS circulation	3rd Quarter 2013	3rd Quarter 2013
Complete Final EIR/EIS	1st Quarter 2014	1st Quarter 2014
Record of Decision	2nd Quarter 2014	2nd Quarter 2014
Issue Request for Proposal	4th Quarter 2013	2ndQuarter 2016
Commercial Close	4th Quarter 2014	3nd Quarter 2016
Contract Award	4thQuarter 2014	4thQuarter 2016
Construction Commencement	1stQuarter 2015	1stQuarter 2017
East & West Segments complete	4thQuarter 2017	4thQuarter 2020
Central Segment complete	4thQuarter 2019	4thQuarter 2023
Operations Commencement	1stQuarter 2020	1stQuarter 2025

The sequence of activities for the P3 delivery would be staged:

- Final Design and ROW Acquisition: West and East Segments 2014 – 2016, and Central Segment 2014 – 2017, all subject to public funding being available.
- Construction of West and East Segments: 2015 – 2018 if funding is available, open to traffic in 2019.
- Construction of Central Segment (90th Street to US-395): 2016 - 2019, and connection between SR-14 and I-15 opening to traffic in 2020.
- Construction of Apple Valley By-Pass from I-15 to SR-18 could follow Central Segment completion, or be delayed until public funding becomes available. It is not included in the present evaluation.

3.0 INTERIM ANALYSIS

3.1. Private Financing Options

Other recent P3 projects in the United States have utilized innovative approaches to leverage public funding and minimize the overall cost of financing. This section briefly provides an overview of the financing options available to the private sector. As explained further in Section 3.2, two of these approaches – Private Activity Bonds ("PABs") and a Transportation Infrastructure Finance and Innovation Act ("TIFIA") loan – were utilized in the financial analysis for the Project.

3.1.1. 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. A recent example in December 2010, involved the Long Beach Court Building, a social infrastructure P3 deal, which 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 debt of $342 million combined with TIFIA finance of $341 million. Currently, shorter tenures 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.

3.1.2. 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 reached in June 2012). 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 toll concessionaire. 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.

3.1.3. Transportation Infrastructure Financing Innovation Act (TIFIA)

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 was recently extended and enhanced with the passage of MAP-21 legislation by Congress.

To date, the credit assistance provided by TIFIA has been relatively modest, with annual program funding of $122 million. Under MAP-21, the program grows to authorized levels of $750 million in FY 2013 and $1 billion in FY 2014. The new TIFIA funding levels would support as much as $10 billion in project loans annually, compared with approximately $1.2 billion of annual lending capacity under prior law, a nearly eightfold increase in lending capacity. A TIFIA loan may now also cover up to 49 percent of total eligible costs (up from the current cap of one-third of total costs).

Additionally, MAP-21 removes the current use of evaluation criteria for project selection in the TIFIA program. Under SAFETEA-LU, TIFIA employed a robust set of eight evaluation criteria, including measures of environmental impact, use of new technology, and innovative project organization and delivery. To replace this selection process, MAP-21 transforms TIFIA into a first-come, first-served program with a rolling application deadline.

The TIFIA program also 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) – 2.82% for a 35 year loan as of August 23, 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 backloading;
- 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;
- 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 pari passu with senior.

3.1.4. Private Equity

Sources of private equity include financial institutions, pension funds, concessionaires and infrastructure funds. 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 assumed cost of funds in the pro-forma financing structure.

3.2. Financial Analysis

The financial analysis seeks to identify a reasonable range of subsidy funding required based on preliminary forecasts for traffic and revenue, estimates for the cost of ongoing operations and maintenance and lifecycle; and construction costs for the Project. The results of the analysis indicate that public funding of between $1.5 and $2.3 billion is required to deliver the Project.

3.2.1. Methodology

The objective of the financial analyses was to identify the range of total cost to Metro associated with the delivery of the Project. Two scenarios – a high subsidy scenario and a low subsidy scenario – were developed to illustrate the potential range of required funding for the Project, summarized in Table 6 below.

Table 6 – High and Low Subsidy Scenarios

	Scenario 1: High subsidy	Scenario 2: Low subsidy
P3 approach	Toll concession including transfer of risks associated with revenue, design, construction, operations, financing and maintenance.	Toll concession including transfer of risks associated with revenue, design, construction, operations, financing and maintenance.
P3 contract term	50 years from the start of construction	50 years from the start of construction
Analysis start date	2012 – includes predevelopment activities to be completed by Metro	2012 – includes predevelopment activities to be completed by Metro
Construction start date – end date	2015-2019	2015-2019
Operations start date – end date	2020-2064	2020-2064
Revenues	Lower estimate forecast for traffic and revenues on the Central Segment	Higher estimate forecast for traffic and revenues on the Central Segment
Timing	50-year toll concession	50-year toll concession
Financing structure	Private Activity Bond and private equity	Private Activity Bond, TIFIA loan and private equity
Cost of financing	Higher cost	Lower cost

The high subsidy scenario capital structure differs from the low subsidy scenario capital structure in that the high subsidy scenario does not include TIFIA[3] and also has higher financing costs. TIFIA

[3] Under Scenario 2 summarized below, the level of TIFIA in the financing structure is assumed not to exceed 33% of eligible project costs. Under the new legislation (MAP21), the total potential level of TIFIA used in the financing structure may be up to 49% of total eligible project costs, and the amount of public subsidy would be reduced accordingly.

loans have been included in the low subsidy scenario, but while the TIFIA program has been reauthorized and enhanced by the MAP21 legislation recently enacted by Congress, it should be noted that the availability of such loans remains subject to several factors including current high demand for such instruments. The capital structure for the high subsidy scenario included:

- Senior debt tranche: in the form of PABs; and
- Private equity to be provided by a toll concessionaire, drawn during construction with dividends being paid during the Project life and final repayment of capital at the end of the concession term.

The capital structure for the low subsidy scenario included:

- Senior debt tranche: in the form of PABs;
- Subordinate debt tranche: in the form of a TIFIA loan; and
- Private equity to be provided by a toll concessionaire, drawn during construction with dividends being paid during the Project life and final repayment of capital at the end of the concession term.

Forecasts for toll revenues, operations and maintenance costs, and capital maintenance costs were used to determine the forecast net cash flow available for debt service and potential return to equity, for each scenario. A lower revenue forecast was used for the high subsidy scenario and a higher revenue forecast was used for the low subsidy scenario to show the range of subsidy required. Based on these net cash flow profiles the Project's capacity for private finance is determined in the form of total debt and total equity available during construction. Adjusting for the potential capacity for private sources of financing from debt and equity, the total cost of project delivery to Metro was derived as:

- Metro funding provided during the construction period of the Project (calculated in the financial analysis as the remaining cost of construction not covered by private financing); and
- Costs for activities outside of the scope of the P3 Project but still within the scope of Metro's Project for delivery (provided as a cost input). For example: monitoring by Caltrans and Metro during construction, pre-development costs before construction start and right of way acquisition.

3.2.2. Results of the Analysis

Under these scenarios, the public funding contribution likely required by the best value proposer falls within a range of $960 million to $1.8 billion YOE for a low subsidy and high subsidy scenario, respectively. The low public subsidy scenario requires a higher toll revenue forecast and lower financing costs with TIFIA, and the higher public subsidy scenario results from a lower toll revenue forecast and no TIFIA financing.

The estimate of Metro retained costs is illustrated in Table 7 below. The sources and uses of funding during construction, including the additional subsidy funding required during the construction period, are provided in Table 8 below.

Table 7 – Financial Analysis – Metro Retained Costs

Central, East and West Segments (YOE $MM)	High Subsidy	Low Subsidy
Central Segment		
Pre-development Costs (PA&ED, surveys): 2012-2014	27	27
Right-of-Way Costs: 2015-2016	190	190
Construction Monitoring: 2016-2019	39	39
East and West Segments		
Pre-development Costs (PA&ED, surveys): 2012-2014	43	43
Right-of-Way Costs: 2014-2016	178	178
Construction Monitoring: 2016-2017	43	43
Total	520	520

Note: ROW, utilities relocation and structures cost estimates for the Central Segment were received from Caltrans after this Financial Analysis was completed, which would potentiallyreduce Metro retained costs by some 60M$, but would not materially change the conclusions below.

Under both scenarios, Metro costs include the cost of predevelopment activities, ROW acquisition and construction monitoring for the project (estimated at $520 million). Therefore, including both Metro retained costs and the construction subsidy as provided in Table 8, total public funding in the range of $1.5 to $2.3 billion must be identified and committed to the High Desert Corridor Project to cover the capital costs of the Corridor.

The Project will likely be successful in attracting several consortia to bid competitively for the toll concession, resulting in the lowest amount of public funding required to build, operate, and maintain the Project compared to other delivery options initially defined in the Strategic Assessment.

As shown in Table 8 below, the leveraging of toll revenues by the concessionaire is estimated to enhance the financing capacity of the Project by approximately $750 million to $1.6 billion in the form of PABs, TIFIA, and private equity. Under the low subsidy scenario (ie. higher estimated forecast for traffic and revenues for the Central Segment), the toll-based financing capacity exceeds the capital costs of the Central Segment ($1.4 billion YOE)by approximately $200 million and would therefore able to cover a portion of the delivery costs for the East and West Segments. This excess financing capacity could be increased under this "high revenue" forecast if the Project obtains a higher TIFIA loan amount (i.e. $945 million) based on 49% of eligible project costs allowed by the new MAP21 legislation.

Table 8 – Sources and Uses of Funds for Pre-Development & Construction of the High Desert Corridor (2012-2019)(Millions, YOE $)

Sources of Funds	High Subsidy	Low Subsidy
Public funds for Metro retained costs	520	520
Construction subsidy	1,759	959
Total Public Funds	***2,279***	***1,479***
PAB	523	663
TIFIA	N/A	637
Equity	224	325
Total Private Financing	***747***	***1,625***
Net revenue and interest	3	3
Total Sources of Funds	**3,029**	**3,107**
Uses of Funds	**High Subsidy**	**Low Subsidy**
Total Metro retained costs	520	520
Construction costs	2,332	2,332
Financing costs	159	234
Net transfers to reserve accounts	18	21
Total Uses of funds	**3,029**	**3,107**

4.0 PROJECT RISKS

Undertaking a large and complex project such as the High Desert Corridor involves risks throughout the development and implementation of the Project. It is critical to identify, manage, and mitigate risks at each stage of the Project.

This section identifies the high-level risks associated with the Project's successful execution and a description of the specific risk mitigation, risk allocation, and risk management approach that Metro will need to apply to each of those risks. This discussion addresses risks associated with each of the general aspects of the Project:

- Development, ROW, environmental and permitting;
- Design and construction;
- Operational; and
- Funding, financial commercial and economic.

As a first step in the risk assessment and management process, the Advisory Team prepared a risk register consisting of a list of potential risks to the successful development, construction and operation of the Project as a toll concession. The register included for each risk its effect, its allocation to Metro or the concessionaire, its probability, its consequence and its impact. The risk register in Appendix D identifies a "long list" of high-level risks associated with the Project's execution.

It is important to note that the financial analysis above assumes the transfer of design, construction, environmental mitigation, financing, operations and maintenance[4] responsibilities to the concessionaire under a toll concession in order to better define the level of public subsidy likely needed to implement the Project beyond the existing environmental and preliminary design phase. That said, the assumption of a toll concession structure does not address the allocation of *specific* project risks between Metro and the concessionaire at each phase of the Project. The level of risk transfer will have a direct impact on the bid price and hence financial viability of the Project.

In the project procurement phase, this risk register would be continually updated with strategies to mitigate each of the key risks and the addition or removal of risks as each project phase progresses, and the results would be incorporated into the Request for Proposals ("RFP"). For each risk/mitigation strategy, the project team would monitor the likelihood of the risk and to make sure the mitigation strategy is still valid in order to initiate mitigation efforts as needed.

4.1. Environmental Permitting

A very probable risk during this phase is delay to the Project due to the environmental approval process. Both the California Environmental Quality Act ("CEQA") and the National Environmental Protection Act ("NEPA") apply to decisions required for implementation of the Project. Both of these laws favor extensive study and public discussion of possible project alternatives and the

[4] Operations and maintenance responsibilities are transferred to the concessionaire for the Central Segment only as the East and West segments are turned over to Caltrans at the completion of construction.

impacts of each in order to inform the public decision-makers as they contemplate approving the Project. The NEPA and CEQA laws dictate an inclusive process in which any one of numerous federal, state and local agencies can hold up or stop the process, add extraordinary mitigation requirements, and/or cause extensive rework or additional studies.

Experience in Southern California has shown that for a major transportation project, environmental approval can take anywhere from two years to more than ten years. While tight management can help facilitate the completion where there is a strong commitment to expedite the process, many aspects of the required analysis are beyond the control of the sponsoring agency and can significantly delay the approval.

For controversial projects, once environmental approval is obtained, the risk of litigation contesting the approval has the potential to further delay (or even stop) the project. While litigation cannot be prevented, the likelihood of success and ability to avoid an injunction can be enhanced by following legal requirements to the letter and carefully documenting the results of the analysis.

For projects for which FHWA is the lead agency for NEPA purposes, litigation under NEPA must be initiated within 180 days of publication of the record of decision in the Federal Register. If there is likelihood of litigation, financial close may be delayed until the 180-day time period has ended. If litigation is filed, financial close may be further delayed.

There are other, less probable risks that may occur during the development and environmental phase. These include:

- Change in political support for the Project;
- Changes in permitting regulations
- Changes in the regional transportation plan;
- Changes in technical requirements ;
- Shift in public attitude toward the Project and/or tolling; and
- Protests from unsuccessful proposers on the Project.

4.2. Right-of-Way Acquisition

The cost of right-of-way and the timing of completing the acquisition of each parcel is another key risk of all projects including those delivered under P3. There are hundreds of parcels involved over the 50 miles of the HDC. The entity delivering the project must be able to rely on eminent domain so that all parcels can be acquired in a timely manner and at fair market prices. For the public sector to exercise its right to acquire property through eminent domain it must be involved in the right-of-way acquisition process.

The ideal strategy, if time is not of critical importance, is to clear the project environmentally and then acquire all of the right-of-way (and relocate all utilities) prior to issuing the RFP for the P3. For projects with tighter schedules, it is possible to obtain ROW concurrently with the completion of the environmental process, consistent with NEPA and CEQA restrictions. It is also common for projects with critical schedules to have shared responsibility for right-of-way costs and the risks for the acquisition schedule can be shared.

For the Project, right-of-way will likely be less important since many parcels to be acquired are located in areas reserved by local agencies for the project through local land use plans, located in in non-developed areas, or may be acquired early by the State during the final design phase, or even as soon as a Locally Preferred Alternative is selected. If alignments or connections vary from the preliminary plan, that additional right-of-way could be required.

4.3. Design and Construction Risks

As with any large project, the Project is subject to numerous construction risks. However due to the location of the Project in the high desert area, the nature of the terrain and the absence of any major structures the construction risks should not be a major issue for the HDC.

A common schedule risk for development of transportation projects is utility relocation. Utility delays are particularly problematic for projects using a design-build methodology, because of the compressed time schedules for design and construction of the relocations and the transportation facility itself. The risk of utility delays can be significantly reduced by negotiating master agreements with utility owners establishing a framework for design and construction of the relocated facilities, and giving the design-builder as much control over this work as possible. Metro already has master agreements in place with many utilities, as does Caltrans, which should help to expedite the process.

Due to the greenfield nature and location of the Project, it seems likely that utility relocations will be limited and their costs will not be a major cost driver for the Project. However, even if the cost is relatively small, it will still be a significant dollar value, and it will therefore be important to create as much certainty regarding the scope and cost of the work as possible. The ability to determine costs in advance is affected by California law prohibiting public agencies from making payments to utility owners for relocations if the agency has a legal right to require the utility to relocate at its own expense. In P3 projects, it is not uncommon for the public agency to transfer responsibility for dealing with utility owners to the P3 partner, with the concessionaire responsible for making payments to utility owners who have prior rights, and for collecting amounts owing from the other utility owners. Regardless of whether the owner or concessionaire is responsible for managing utility payments, it is critical to identify the facilities that may be affected by the Project, in advance of obtaining bids, and also to require the design-builder to undertake appropriate pre-construction surveys to reduce the likelihood of disruption to the construction schedule due to discovery of a previously unknown facility.

Hazardous materials risk involves considerations in addition to the cost of remediating and otherwise managing the materials found on-site, since clean-up costs can be quite high. Typically the concessionaire will assume responsibility for cleaning up known contamination, but cost and schedule relief is generally allowed if unknown contamination is found.

P3 projects are almost always delivered using a design-build approach. With this approach design is always fast-tracked to provide layout details as early as possible so that construction can start while design is being finished. Timeliness of design reviews/approvals is a significant risk during this phase. Metro, or its construction manager, will have to track the design review process closely to make sure design comments are provided within the time specified. Metro will need to work with Caltrans to make sure they are prepared to play an appropriate role in the process. Reviewing design and monitoring construction the same way it is done in the traditional design-bid-build approach will result in delay and extra cost to the design-build contractor, followed by claims against Metro. It would appear advisable for Metro and Caltrans personnel who will be involved in the Project to seek the benefit of lessons learned from the Presidio experience, as well as from previous Metro/Caltrans projects.

Other risks that are typically transferred to the concessionaire are the adequacy of the design, issues related to the design-construction interface and typical construction risks such as performance, material and labor availability, traffic management, site safety and security, etc. These can be significant risks and assignment to the concessionaire who has control over these items is one of the main advantages of a P3 approach. During the execution of the contract Metro and Caltrans need to take care not to require changes to the design concept upon which the Project was bid, as this may result in transfer of cost and schedule risks back to Metro that were transferred contractually to the concessionaire.

4.4. Maintenance and Lifecycle Risks

Once the Project is placed in service a new set of risks will be faced. These can be either operational or related to maintenance of the facility and systems. The most likely operational risk is lower traffic and revenue than forecast. That risk is discussed in the next section. However, other operational risks may impact revenue. Traffic congestion at adjacent facilities may limit throughput to less than the planned capacity of the facility, traffic accidents, disabled vehicles and other incidents on the facility or the East and West segments or the interchanges with SR-14 and I-15 would reduce traffic flow and thus revenue. Failure of the toll collection system and/or vehicle license plate readers can also result in lost revenue. A higher than anticipated percentage of violations would increase operating costs due to additional staffing for violation processing and also reduce revenue since a percentage of the violators may never be identified, or if identified, tolls, penalties and administrative costs never collected. Other risks during operation that can impact revenue and operating costs include safety related issues, hazardous waste spills, excessive debris removal requirements and flooding.

Other operational and maintenance risks will be related the cost of maintaining and testing of the pavement, communications and incident detection systems. These are systems that ensure public safety and must be kept fully operational at all times.

4.5. Funding, Financial, Commercial and Economic Risks

4.5.1. Funding Risks

As outlined in Section 2.5, the public funding for the Project consists of Measure R and federal earmarks for planning and environmental studies. Risks associated with the level and timing of funding from each source include:

- Measure R has been programmed to support planning and environmental studies only. Currently, no capital funding is currently programmed. The potential for additional Measure R funding for the Project is discussed below in Section 7.1.

- A modest allocation from San Bernardino County's Measure I program may be available after FY 2020. As such, there is a clear mismatch between the availability of Measure I funds and potential milestone payments during the construction period to the private partner under the P3 options considered in this report, which would likely occur earlier than FY 2020.

- A ban on future federal earmarks, once considered a potential major source of funding for the Project, is likely to remain in place for the foreseeable future. In addition, existing earmarks allocated to the Project may now be in jeopardy following an announcement by USDOT on Friday, August 17, 2012 that all unobligated earmarks appropriated during FY 2003 – FY 2006 would be redirected to State DOTs for expenditure on other eligible

transportation projects. Two earmarks for HDC totaling approximately $3.9 million are affected by this directive. Caltrans intends to work with the regional project sponsors of HDC, including Metro, SANBAG, and the JPA, to preserve funding, but failure to obligate existing earmarks by December 31st could translate into a loss of funds at a critical stage in the Project.

4.5.2. Financing Risks

The ability to secure financing for the Project 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;
- Unanticipated higher costs of debt at the time of agreed pricing;
- Uncertainty surrounding the future market appetite for municipal tax exempt or private financing;
- The expected liquidity of the financial markets, which may be affected by economic factors such as a lack of sustained economic recovery or capacity constraints caused by an over-demand of projects;
- Constraints on alternative financing approaches, including availability of TIFIA and PABs in sufficient quantity to provide capital for the Project at the appropriate time; and
- Impact of tolling policy on revenue generation potential and the ability of the project to support debt.

4.5.3. Commercial Risks

Early risks related to the commercial viability of the Project include:

- Shortages in available general and specialized contractors due to simultaneous execution of multiple mega-projects in the Southern California region, resulting in a lack of competitive bids and/or early withdrawal of bidders; and
- Inability to obtain specified levels of performance or payment bonds;

There are additional risks associated with the operations phase of a highway toll facility. Actual traffic and revenue could be lower than the forecast used to obtain concessionaire financing. In the event of lower than expected revenues, the concessionaire will first try to reduce operating costs and/or invest more equity in the project. Inability to meet debt service over the long term could cause bankruptcy, with the facility continuing to operate but the concessionaire losing control of (and its equity investment in) the project.

The SR-125 toll road in San Diego County is an example of a toll concession project which went into bankruptcy. The toll road was ultimately taken over by creditors and sold to the San Diego Association of Governments ("SANDAG") for much less than the debt on the concessionaire's books. SANDAG operates the toll road and collects toll revenues. It is important to note that throughout all of these events, the toll road was operated and maintained as planned and the public benefited from the mobility improvements associated with a new highway built decades earlier and at a fraction of the cost than it would have as a public project.

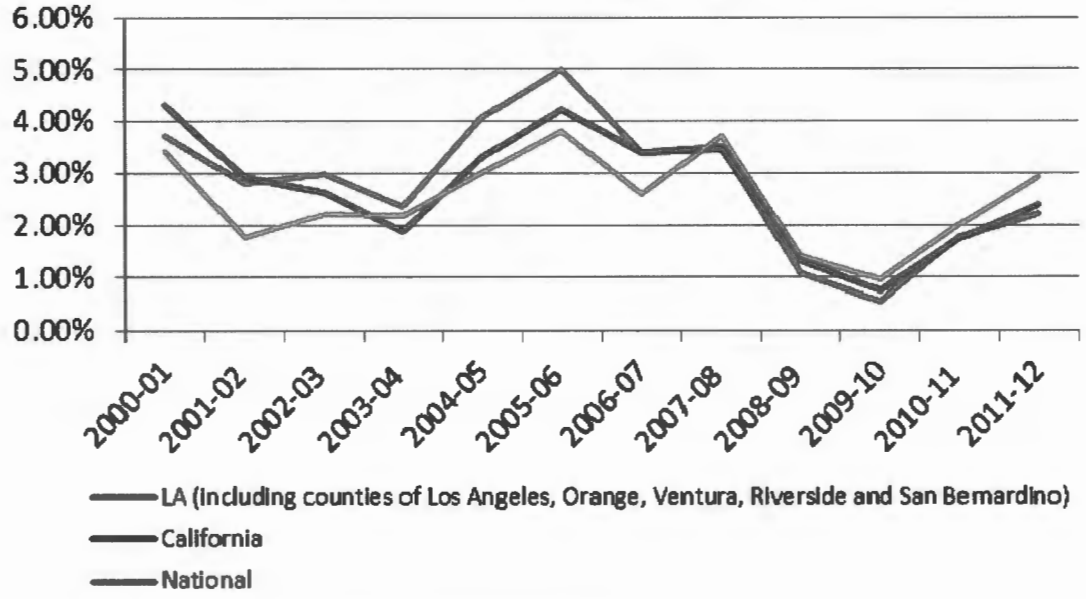
4.5.4. Economic Risks

A key economic risk is the uncertainty surrounding the ability to forecast inflation of costs and revenues over the expected construction phase and operations of the asset. Figure 9 illustrates the CPI for the LA region, California and the United States since 2000.

Metro's Measure R program to deliver approximately $40 billion in projects may by itself have a broader impact of increases on labor and commodities prices throughout the region.

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

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



Source: California Department of Finance data website.

5.0 OPTIMIZING RISK TRANSFER

In preparing the terms and conditions for the Project P3 agreement, one of the most important aspects will be the allocation of project risk. The key consideration is that risk should be assigned to the party best able to control the risk and/or mitigate the impacts of the risk. Responsibility for project risk must be balanced between the public sector and the private sector. Often public agencies err by trying to shift all the risk to the concessionaire. This can result in no responses to the request for proposals or very high prices in the proposals that are received. Likewise, the public sector should not be responsible for risks that are within the control of or can be more efficiently managed by the concessionaire.

The strategy for allocation of project risk in the agreement is a critical issue in the procurement of a P3 project. A risk register has been prepared as part of the Strategic Assessment phase of the Metro P3 Program (Appendix D) and will be further developed and updated during the Procurement phase of the Project. In the Procurement phase, a draft term sheet encapsulating the risk allocation plan proposed in the Strategic Assessment will be developed and circulated to the industry for comments in the industry outreach portion of the Procurement phase. Legitimate concerns from potential concessionaires will be addressed in order to achieve competitive proposals and prices.

Experience has shown that assignments of responsibility for the following risks are usually the most challenging, as neither party can fully control:

- Political support;
- Environmental permitting;
- Litigation;
- Regulatory changes;
- Mitigation for environmental impacts;
- Historic/cultural resources;
- Third party issues;
- Subsurface conditions;
- Hazardous materials; and
- Major force majeure events such as terrorism, earthquakes, etc.

The responsibility for each type of risk must be clearly spelled out in the terms and conditions of the P3 agreement so that there is no misunderstanding and to avoid future litigation. Several of these areas of risk are discussed in more detail below.

5.1. Environmental Permitting

For transportation projects in the US, the cost and time to obtain environmental approval for construction is a risk many concessionaires are reluctant to consider. The private sector has very little control over the process. Therefore, this cost and schedule risk is best taken by the public sector. In fact, to encourage private interest in the Project and to attract the most competitive

bids, the ideal strategy from the standpoint of reducing this risk is to have completed the environmental process and have the Project cleared for construction prior to issuing the RFP for a P3.

Unfortunately waiting for environmental approval prior to issuing a RFP significantly extends the duration of the project delivery time. Agencies often reduce delivery time by overlapping environmental and P3 procurement activities. Additionally, for projects in which the concessionaire will have latitude in project definition, particularly in areas that may allow a significant reduction in project cost or increase in revenue forecasts, it can be highly beneficial to have the concessionaire selected and on board prior to completion of the environmental process. Giving the concessionaire the opportunity to provide input in finalizing the definition of the project prior to completion of the environmental studies not only saves time but ensures that the project cleared is the project that is to be built. For the HDC, the current schedule assumes that the RFP could be issued after the Draft EIR/S is circulated and comments received, without waiting for the ROD.

5.2. Right-of-Way Acquisition

For the Project, right-of-way risk is mitigated since much of the ROW is either already identified in local land use plans or is in relatively undeveloped areas. The time and cost to acquire the ROW or easements could adversely impact the Project and should probably be borne by the concessionaire who controls the detailed design. In any event, it is important that the potential need for any additional ROW outside of the existing design be identified as early in the development process as possible.

5.3. Design and Construction Risks

One primary advantage of design-build and DBFOM over the traditional design-bid-build is that it shifts the responsibility and risk for the design/construction interface from the owner to the concessionaire. This takes the owner out of any disputes or claims between the contractor and designer. As long as the owner complies with the terms of the design-build contract and does not change the project concept or performance requirements after the contract is executed, there is very small likelihood of valid claims against the owner with this type of delivery.

A DBFOM delivery method provides the most effective risk transfer from the owner to the concessionaire. With this delivery method, the design-build contract is typically between the concessionaire and design-build contractor. The owner is not a party to the contract. The concessionaire is responsible for implementing the project for fixed terms and all of the risks during design and construction are borne by the concessionaire other than those specifically assigned to the owner in the concession agreement, or comprehensive development lease agreement ("CDLA").

Risk transfer is a very important feature of the P3 approach to project delivery. Importantly, larger and more complex projects tend to have proportionately larger construction cost overruns post-contract award, which can hinder project completion.[5] Management of the risk of

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[5] For example, the U.S. General Accounting Office has published a study of 26 DBB highway projects with a construction value of over $100 million, constructed from 1998 to 1993, which showed an overage cost overrun of approximately 41 percent. For the largest of these projects (at the 80th percentile), the cost overrun was reported at 55 percent. See United States General Accountability Office, "Managing the Costs of Large-Dollar Highway Projects," Report to the Chairman, Subcommittee on Government Management, Restructuring, and the District of Columbia, Committee on

cost-overruns and late completion is best managed under a DBFOM, since concessionaires are likely to require stricter project scope definition and to actively oversee the project delivery to make sure costs are controlled to a greater extent than might be the case under a DBB option. Private finance providers are also likely to undertake a more rigorous due diligence regarding the technical and financial ability of the constructions and operations contractors to complete their work within the committed project financing. A toll concession DBFOM adds the additional incentive of revenue to the concessionaire since the sooner the facility is open to traffic, the sooner revenue is collected.

5.4. Maintenance and Lifecycle Risks

The operations contractor will carry out routine maintenance and cleaning of the facility, toll collection system and traffic management system and will be responsible for scheduling and conducting long-term capital maintenance. The cost of either routine or capital maintenance may be higher than planned, but failure to perform required maintenance can be even more costly over the long run. That will be risk borne by the concessionaire. Metro's and Caltrans' role is to monitor these activities to make sure the terms of the CDLA are adhered to and the tollway remains safe for the traveling public.

The CDLA (and the concessionaire's financing agreements) will require a financial plan that provides an adequate budget each year for operations and maintenance of the facilities. Optimum maintenance of the facility is critical to the financial success of the concessionaire to assure availability and a high quality facility at the end of the term when the facility will be turned over to the public agency without major expenditures. A requirement for the concessionaire will be inspections and routine maintenance carried out each year in accordance with the optimized maintenance plan. The concessionaire will not have the option of deferring maintenance which can result in more frequent and costly major rehabilitation activities. This shift of maintenance risk is a significant benefit of the P3 delivery approach.

If the Project were delivered through a traditional design-bid-build approach, the public agency that owned the facility would be responsible for maintenance and operation of the roadway. The agency would be required to have another source of funding to pay operating costs, maintenance costs and debt service for construction bonds should any of these costs exceed plans or revenues be reduced due to unplanned incidents.

Concessionaires experienced in working under design-build operate and maintain (DBOM or DBFOM) agreements will have experience in assuming responsibility for ongoing maintenance and periodic rehabilitation (life cycle) costs. It is possible to reasonably estimate annual and periodic maintenance costs over a long period of time to meet a specific maintenance standard such as Caltrans' and based on forecasted levels of traffic. Often there is consideration for force majeure events such as major earthquakes that are an ever-present risk in Southern California. To obtain reasonable proposals for a toll concession on the Project, the concession agreement will need to include provisions allowing appropriate relief for major force majeure events such as earthquakes.

Governmental Affairs, U.S. Senate, February 1997. Quoted in Arup/PB Joint Venture "Analysis of Delivery Options for the Presidio Parkway Project", CTC Project Proposal Report Submission (February, 2010).

5.5. Traffic/Revenue Risks

For any P3, one of the most important risk allocation decisions is who takes the risk that future revenue will be sufficient to cover operating costs, long term maintenance and rehabilitation costs, debt service and a reasonable return on equity (as private equity is expected to be a significant part of the funding mix).

If the HDC is implemented through a toll concession, then the concessionaire would be responsible for all costs of the Project, save the public subsidy or contribution and the O&M costs of the East and West segments, with limited rights to claims and change orders. This would relieve Metro of obligations attendant to any shortfall that might occur as a result of underperformance of toll collections, other than what might be specifically provided for in the concession agreement. Conversely, if Metro retains the risk of revenue shortfalls, some amount of Agency funds would presumably need to be encumbered to cover this risk and thus would not be available for other projects. The other side of the coin in this regard, is that the concessionaire would also reap the benefits of revenues exceeding expectations. However, a sharing of excess revenue provision can, and typically would, be included in the concession agreement, particularly if Metro assumes some of the down-side risk.

6.0 APPROACHES TO PROJECT DELIVERY

6.1. Comprehensive Development Lease Agreement

This section discusses one potential approach to delivering the Project as a P3. Under SB 4, Metro has the ability to enter into a P3 through a CDLA, with a concessionaire for development of the Project as authorized by Streets and Highways Code, Section 143 ("SB 4"). This is subject to selection and approval of the Project by the California Transportation Commission ("CTC"). The schedule for delivery of the Project is driven by the environmental process. The approach presented here accelerates the procurement to the extent compatible with the environmental approval process, conforms to existing legal requirements, and enables a selection of the concessionaire based on a fixed price bid as early as possible.

The selection of the concessionaire will be based on a fixed price for design and construction of the East and West Segments and the amount of a proposed public contribution, if any, for the tolled Central Segment as soon as public funds are committed to the East and West Segments. It will involve a three-step procurement starting with the industry outreach phase followed by a prequalification process to narrow the field of potential proposers down to a short list of qualified teams to be allowed to submit priced proposals in response to the RFP. The last step would be the final selection of the concessionaire team based on the best value to Metro and the public, and the subsequent negotiation of a CDLA.

The best value determination would include two components:

- The proposed technical approach, schedule and the level of public participation, if any, needed to allow the concessionaire to finance, design, build, operate and maintain the Central Segment of the Project as a toll road for 50 years.

- The proposed technical approach, schedule, price and schedule of payments for design and construction of the West Segment and East Segment when done in conjunction with the Central Segment.

The CDLA will define the performance standards to be met by the Project for construction, operations and maintenance over the life of the lease. It will define the rules for setting tolls and all reporting requirements. It will also define the process for the concessionaire to turn control of the East and West Segments back to Caltrans after completion of construction of the entire Project and of the Central Segment at the end of the lease, including the minimum requirements for physical condition of the roadway, structures and traffic/toll collection systems that make up the Project.

6.2. Procurement Approach and Timeline

If the LPA includes a tolled Central Segment, the schedule for issuance of the final RFP will be linked to the public circulation of the Draft EIR/EIS and the draft project report ("PR"). These two documents provide official project definition and traffic forecasts that can be used to estimate the costs of final design, construction and environmental mitigation, as well as operations and maintenance costs. These, together with proposers' own toll revenue forecasts, enable proposers to develop financial plans and submit a fixed price bid specifying the amount of public contribution needed to deliver the Project. The draft EIR/EIS and PR become contract documents as part of the RFP to partially define the scope of the Project.

The RFP will likely request two proposals; one technical to present the organization, project management approach and detailed plan for execution of the project; and the other to present the proposed financial approach, the prices for the East and West Segments and the amount of public financial participation, if any, needed for the tolled Central Segment. The financial proposal will be due approximately one month after the technical proposal is submitted. The design-build prices and the amount and timing (on a Net Present Value basis) of public participation identified in the financial plan submitted in the proposals will be the primary measure of price competition for concessionaire team selection. A key requirement of the process is transparency to the public to inspire confidence in the integrity of the process.

A list of key milestones with anticipated dates is shown in Table 9, assuming a reasonable expectation that the necessary public funding will be secured by Metro. Some float has been incorporated into the schedule in anticipation of the delays in EIR/EIS issuance associated with the recent addition of a "rail service component" alternative. In the event that the alternative including a rail service is selected, the procurement and delivery process will be amended accordingly.

Table 9 – HDC Preliminary Procurement Schedule

Activity	Anticipated Dates
Board Approval to Proceed with Task 5/6	July 2012
Issue RFI	December 2012
Industry Outreach, RFI General Meeting, one-ones	January – March 2013
Issue RFQ	March 2013
Board Selection of Locally Preferred Alternative	Spring 2013
Submit TIFIA Letter of Interest	Spring 2013
SOQ Due Date	May 2013
Circulate Draft EIR/EIS	Summer 2013
Shortlisting announcement	July 2013
Issue Draft RFP for review by shortlisted teams	August 2013
Submit Request for P3 Selection to CTC with Project Proposal Report Prior to CTC Public Hearing	September 2013
CTC hold Public Hearing and Approve Project	November 2013
Issue Final RFP	November 2013
Issue Final Addendum to RFP	January 2014
Technical Proposal Due Date	February 2014
Financial Proposal Due Date	March 2014
Record of Decision	Spring 2014
Notice of Intent to Award	May 2014
P3 Agreement Final Form	June 2014
Metro hold Public Hearing	June 2014
Submission of P3 Agreement to PIAC and Legislature for 60-day review period	July 2014
Notice of award	September 2014
Execute CDLA	October 2014
Financial close	December 2014
Start of Final Design and Construction –West Segment	January 2015
Start of Final Design and Construction –East Segment	January 2015
Start of Final Design – Central Segment	Spring 2015
Start of Construction – Central Segment	January 2016
Opening to traffic East and West Segments	January 2019
Toll Operations Commencement – Central Segment	January 2020

6.2.1. Legal Authority

Section 143 of the California Streets and Highways Code as amended by Chapter 2 of the Statutes of 2009 (Senate Bill 4, Second Extraordinary Session) ("SB 4") authorizes Caltrans and

regional transportation agencies ("RTA") such as Metro to enter into a CDLA, with public or private entities for P3 agreements. SB 4 further provides that P3 projects and associated lease agreements shall be submitted to the California Transportation Commission ("CTC"), which shall select and approve projects subject to a review by the Public Infrastructure Advisory Commission (PIAC) and the legislature prior to execution of the final agreement. The authority for P3 under SB 4 sunsets on January 1, 2017, which means the CDLA would need to be executed prior to this date.

CTC has issued policy guidance for this procedure for P3 projects (Resolution G-09-13, passed October 14, 2009). This CTC guidance sets forth CTC's policy for carrying out its role in implementing P3 projects and assisting and advising Caltrans, RTAs, and private entities that may be contemplating the development of P3 agreements.

6.2.2. *Metro's Role and Internal Structure*

This Interim Business Plan assumes Metro leads the procurement of the CDLA with support from Caltrans. Once the CDLA is executed and an unlimited notice to proceed is issued to the concessionaire, control of the Project shifts to the concessionaire. The roles and responsibilities of Metro and Caltrans, as well as their extent of control during project delivery and operations need to be clearly defined in the CDLA. The Project will be part of the State highway network and Caltrans has a statutory duty to review and monitor design, construction, operations and maintenance of the Project for compliance with State and Federal standards to the level of detail required to ensure public safety. Metro or Caltrans will be entering into the CDLA with the concessionaire. The Agency's role is to administer the lease agreement to verify that all parties comply with all requirements of the lease agreement. Metro or Caltrans will also be required to provide agreed financial contributions to the concessionaire as defined in the final financial plan and the CDLA.

Metro and Caltrans will only exercise review and approval rights over toll policies to the extent stated in the CDLA.

It is anticipated that a new group would be created in Metro to administer this and any other P3 projects developed by Metro. This may be a joint office with Caltrans which will also have an ongoing role in monitoring project activities and operations.

7.0 NEXT STEPS

This section summarizes in chronological order the next steps needed for construction of the Project to begin by January 2015. Generally these activities fall into the following broad categories:

- Search for public funding; financial plan update;
- Preliminary engineering and environmental studies;
- Approval for delivery of the Project through a CDLA; and
- Issuance of RFP and selection of the concessionaire.

7.1. Secure Additional Public Funding

The Project is defined such that the entire Corridor would need to be constructed as a single project to enable access to and tolling on the Central Segment; the Central Segment does not by itself have independent utility. Based on the financial analysis, the toll revenues from the Central Segment may be able to provide a significant share of project financing. The completion of all three segments is critical to the viability of the Project.

Because toll revenues are unable, even under the most optimistic scenario, to provide sufficient financing capacity to construct the entire Project, however, additional public funding will be needed before the delivery method recommended here can be effectively implemented. As stated previously, Metro, SANBAG and the HDCJPA should target a public funding range of $1.5 to $2.3 billion YOE to buy down the capital cost of the Project and attract P3 investment interest in a toll concession. In accordance with the new MAP21legislation, the Project could be eligible for a higher amount of TIFIA loan based on up to 49% of eligible project costs (instead of 33% in the current financial analysis) and, if approved, the amount of public subsidy needed would be reduced accordingly.

In general, local contributions will be a key element of the overall strategy for leveraging different sources of highway funding. In Section 3.1, the Team identified a range of innovative financing approaches that could be utilized to accelerate project delivery; however, the advantages of these approaches cannot be harnessed without additional public funding that can be committed as repayment sources.

Accordingly, Metro is encouraged to firm up existing local funding commitments from its Project partners, namely the HDCJPA and County of San Bernardino, which has identified but not yet programmed future Measure I funds that could go towards the Project.

Metro may also be able to provide additional Measure R funds to the Project if the proposed extension to Measure R is approved by voters in November 2012. Under that scenario, an additional $512 million in highway bonding capacity is estimated to be available for existing Measure R projects in the North County subregion, where the High Desert Corridor is located. The Corridor would likely receive a substantial share of the $512 million in estimated additional funds, subject to programming decisions by the Metro Board. Further demonstration of project readiness and financial viability through the execution of the next steps outlined in the following sections will strengthen the rationale for programming additional Measure R funding.

Conversely, the identification and commitment of the necessary public funding for the pre-development activities and the ROW acquisition will be critical in confirming the priority assigned to the Project, and attracting potential bidders during the next phases of the procurement, should the Metro Board decide to pursue the P3 approach proposed for the Project.

Equally critical to attract proposers and to the finance ability of the Project, as discussed in the Financial Analysis section, will be the availability and amount of a TIFIA loan. It would therefore seem beneficial to get the TIFIA application process in motion, starting with Metro's Letter of Interest, as far as possible well before the proposals due date so that proposers have as much information and certainty regarding TIFIA financing availability. This would enable proposers as well as Metro to judge whether TIFIA can or should not be included in proposers' financial proposals.

7.2. Complete Preliminary Engineering and Environmental Studies

Caltrans and the City of Victorville began the PA&ED work for the West Segment and the East Segment[6] of the HDC in 2007. In July 2010, Caltrans took over responsibility for preparing PA&ED for the entire HDC project from SR 14 to I-15 and its 14-mile connection to SR-18 east of Apple Valley, including ROW reservation for future High Speed Rail service. A new Notice of Intent ("NOI") and a new Notice of Preparation ("NOP") were issued in September 2010, and new scoping meetings were conducted in the fall of 2010. The Project will be cleared under both CEQA and NEPA.

A new alternative to include passenger rail service between Palmdale and Victorville as part of the Project was added in April 2012. This has delayed circulation of the draft EIR/EIS and it is now expected in the summer of 2013. Assuming no major opposition to the Project, a ROD is anticipated in the spring of 2014 if a build alternative is selected, for the freeway/expressway alternative, the freeway/tollway alternative analyzed herein, or for the HDMC including rail service between Palmdale and Victorville.

7.3. Metro Board Approval on Project Delivery Method

With this business plan as input, a decision will need to be made by Metro on the approach to be used in delivering this Project if it is approved under CEQA and NEPA. Other options would be to pursue it as a design-bid-build project or as a design-build project. Based on the work done to date through the Strategic Assessment of the six projects selected by Metro for a P3 evaluation, and the work documented in this Interim Business Plan, the best value for money to the public considering the trade-off between costs and risks among the three approaches is achieved through the P3 approach. This will be further confirmed following the industry outreach and CTC approval process discussed below.

If the project delivery decision is made after the final CEQA and NEPA approvals are received, it would delay opening of this Project by at least two years. This would substantially increase the costs, delay the collection of revenue and delay the accrual of the benefits of the Project to the community and the traveling public. State and federal laws allow proceeding with certain procurement and project approval activities prior to satisfying CEQA and NEPA requirements and a Metro decision on the delivery method is the first step.

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[6]Including the Apple Valley Segment

7.4. Initiate Industry Outreach and CTC Approval

Board approval to develop the Project through a P3 triggers the start of the procurement and the CTC interaction. The first of these would be industry outreach and initiation of discussions with the CTC staff for approval of the Project for development through a CDLA. Also at this step a more focused search for public funding for the East and West Segments would begin.

The initial step in the industry outreach consists of public announcements in industry publications requesting comments on the proposed project scope and delivery framework along with a letter of interest ("LOI") to receive a future RFQ. Individual companies will be allowed to respond without spending the time and effort (if they have not already done so) to form teams to pursue the Project.

Before the request for LOI is published a project website focusing on P3 delivery of the Project will be set up. This website will contain the preliminary scope of the Project, the preliminary procurement schedule, the proposed general terms of the CDLA, a copy of this business plan and other relevant documents that may be available.

Following publication of the request for LOIs, Metro and its consultants will be available to meet one-on-one with prospective proposers to answer questions and get feedback for improvements to the proposed scope, delivery plan, terms, CDLA and procurement process. This feedback will need to be documented and appropriate suggestions reflected in the CDLA and procurement documents as they are prepared.

Based on the input from the industry and further analysis of the delivery options, a decision will be made on the structure of the CDLA and how Metro funding will be provided to the concessionaire, both for the tolled DBFOM segment and the end design-build segments. This is a key decision for project delivery as the type and amount of these payments will ultimately be the primary financial criterion for concessionaire selection.

Metro made a preliminary presentation of the Project to the CTC in July 2011. While the information is being assembled for the P3 website, Metro must re-initiate discussions with the CTC staff to update them on the Project and to obtain the latest information on the administrative processes related to CTC approval of the Project for development under a CDLA.

Under SB 4, a proposed P3 project must be submitted to CTC for selection before Caltrans/Metro begins a public review process for the final lease agreement. A project proposal report will be prepared by Metro and submitted to the CTC at least 45 days prior to the CTC meeting at which this selection is desired. This report will present a quantified analysis of the costs and benefits of the Project. Along with the project proposal report, the final RFP and all procurement and contract document attachments such as the CDLA and evaluation process and criteria is submitted.

Once the project proposal report is submitted to the CTC, Metro and its advisors will continue to meet with CTC staff and consultants hired to review the application. These meetings will allow Metro to respond to questions and expand on information submitted with the application.

Pursuant to CTC policy guidance (Resolution G-09-13), CTC selects and approves each P3 transportation project (as defined in §143(a)(6),) through the adoption of a resolution at a regularly scheduled meeting (see § 143(c)(2) and clause 2 of the policy guidance).

Caltrans/Metro may engage in preliminary steps leading to the development of the draft CDLA agreement, including the general solicitation of statements of qualifications and the

prequalification of contracting entities, prior to submitting the project proposal report (see clause 4 of the policy guidance). However, Caltrans/Metro shall not issue the final RFP, nor conduct a final evaluation of proposals, prior to CTC approval of the P3 Project (see clause 4 of the policy guidance). CTC must approve the Project, certify useful life determination (for Caltrans projects only), adopt evaluation criteria (if qualifications/best value is used) and review the draft agreement (§ 143(d)).

7.5. Prequalification Phase

During this phase, Metro will refine the procurement plan, identify a selection committee and a project financial committee, and begin preparing the concessionaire selection criteria and request for qualifications. Project documents including a preliminary scope, procurement plan, and draft CDLA will be updated based on the information received from prospective proposers. After review and approval, the RFQ will be issued by Metro. It is anticipated that approximately two months would be allowed for the concessionaire teams to prepare and submit statements of qualifications ("SOQ"). These SOQs would be evaluated by a Metro selection committee and a list of prequalified concessionaires issued.

7.6. RFP Phase

Once the shortlist of proposers is selected and issued by Metro, an updated draft of the RFP and proposed procurement and contract documents will be sent to the prequalified teams for review and comment. Approximately three months will be allowed for proposer reviews and comments. Confidential one-on-one meetings will be held with each team during this period to candidly discuss their issues related to the proposed CDLA and other documents. All comments received will be evaluated by Metro and the project team.

The final RFP will be issued after those comments deemed acceptable are incorporated into the procurement documents and the following conditions have been met:

- CTC approval of the project delivery method is received;
- FHWA approval to proceed with P3 procurement ahead of the ROD is received;
- A source of funding for the end segments has been identified (and committed?); and
- The draft EIR/EIS and draft PR have been circulated.

It is anticipated that approximately four months will be allowed for preparation of technical proposals, and five months for the financial proposals. The final addendum to the RFP, which is expected to include the final EIR/EIS and ROD, will be issued no later than 30 days prior to the technical proposal due date.

Evaluation of the technical portion of the proposals will begin by the Metro selection committee as soon as the proposals are received. The rankings will be held confidential until after the financial portion of the proposals are received and evaluated by Metro's project financial team. The scores from the technical evaluation and the financial evaluation will be combined with a predetermined (and public) weighting to rank the proposals on best value. Metro would then issue a notice of intent to award to the selected concessionaire.

7.7. Finalization of the CDLA and Review by PIAC and Legislature

Following concessionaire selection, Metro would finalize the draft CDLA and at least 60 days prior to executing a final lease agreement, submit the draft lease and any comments from the public hearing(s) to the legislature and the Public Infrastructure Advisory Commission ("PIAC") for review. The legislature or the Secretary of Business, Transportation and Housing may provide written comments to Metro within this 60-day period. Metro would be required to consider those comments prior to executing the final lease. However, Metro retains discretion with regard to executing the final lease and no approval from the legislature or PIAC is required.

If Metro finds it necessary or appropriate to make changes that alter the project scope, CTC expects that the agency will request approval of the change by submitting a supplement to the project proposal report setting forth a description of the change and the reasons for it. CTC will place a proposed project supplement on its agenda in sufficient time to allow action to be taken on the requested change within 45 days after CTC receives the supplement.

7.8. Financial Close and Start of Construction

Once the CDLA is executed the concessionaire would submit the necessary documentation and close financing. The preliminary schedule used for this Business Plan assumes approximately two months from execution of the CDLA to financial close. This timing is controlled by the concessionaire and could vary. The timing of financial close can be accelerated by the concessionaire by completing all of the conditions required for closing during the sixty day period of PIAC and legislative review. In this case, financial close can occur immediately after execution of the CDLA. One caveat could be the status of the environmental approval; if the record of decision was issued less than six months prior to execution of the CDLA and there are perceived threats of litigation, there may be an imposed condition to wait to close finance until six months from the record of decision when the NEPA window for lawsuits closes.

Design and construction can start as soon as funds are available to the concessionaire. For purposes of this business plan it is assumed that final design and construction starts in January 2015 on the East and West Segments, followed by final design in the spring of 2015 and construction in January 2016 on the Central Segment. It is also assumed that the Central Segment begins toll operation in January 2020.

Appendix A: Capital Costs

Capital costs estimates for the West and East Segments of the High Desert Corridor were initially prepared by the Advisory Team for the Strategic Assessment of the Project, based on the preliminary design estimates available in 2010 from Caltrans and the City of Victorville, respectively.

For the Central Segment, only a preliminary horizontal alignment and vertical profile was available at the time of the Strategic Assessment. Considering the location of this segment in the desert area, the Team developed capital cost estimates using unit costs, generic quantities per mile for earthworks, drainage, pavement, structures and traffic items, and a provisional number of interchanges.

As the initial technical studies have now been incorporated in the new PA&ED currently under preparation for the Project, the cost estimates of the Strategic Assessment have been used for this Interim Business Plan after checking their consistency with specific cost items when new estimates became available.

Table 1 – Capital Costs Summary (Millions, 2011 $)

Item Description		West Segment	Central Segment	East Segment	Total
1	Design, management, surveys	37	66	35	138
2	Construction monitoring	19	32	18	69
3	Environmental mitigation	18	37	24	79
	Roadway				
	1. Earthworks	41	125	61	227
	2. Pavement	38	146	69	253
	3. Drainage	31	79	38	148
	4. Specialty Items	35	63	40	138
	5. Traffic Items	30	47	11	88
	6. Minor Items	18	46	11	75
	7. Mobilization	19	50	23	92
	8. Additions	19	50	12	81
	9. Contingencies	46	101	46	193
4	Roadway Subtotal	277	707	311	1,295
5	Structures	158	42	105	305
6	Toll Collection Systems	-	23	-	23
7	Land Costs / Right-of-way	91	167	67	325
	Total Project Costs (2011 $)	**600**	**1,074**	**560**	**2,334**

Appendix B: Traffic & Revenue Forecast Methodology

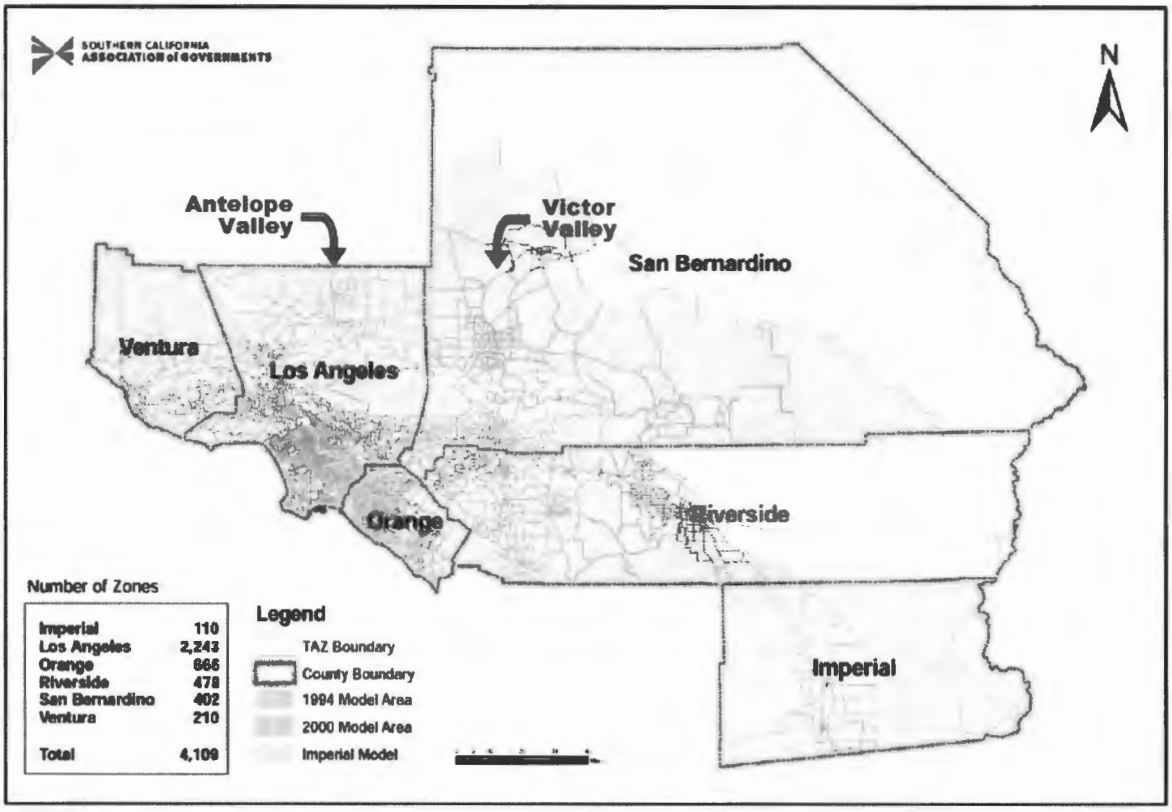
A number of studies have been performed to predict future traffic without tolls on the HDC Project (Parsons, Metro). These studies primarily used the SCAG regional model that is based on a comprehensive four step process for demand forecasting. It should be noted that the model year for these studies was 2030, whereas the updated SCAG model that also reflects the current downturn in economy uses 2035 as future model year. The traffic and revenue forecasting for the Project is based on the updated SCAG model.

An important aspect of this missing east-west link between I-5 and I-15, due to its unique location and connectivity that it will provide, is that while the Project will be a new road, the characteristics of demand forecasting more closely resemble a brownfield traffic and revenue analysis (T&R) than a greenfield one. It is worth mentioning here that the fundamental modeling methodology and its application for T&R forecasting remain same for both greenfield and brownfield projects.

Existing Network and Traffic Conditions

The traffic and revenue forecasts for the Project EIR/S and for this Business Plan were produced by Parsons Transportation Group ("Parsons") using the SCAG Regional Transportation Model. The updated SCAG model is based on a comprehensive four step process for demand forecasting. It covers the entire SCAG region which includes six counties and 187 cities located within those counties. The coverage of the SCAG regional model is illustrated on Figure 1 along with the boundaries of traffic analysis zones ("TAZ"). The regional model zone system contains 4,109 TAZs, 31 port related TAZs, 12 airport TAZs, and 40 cordon stations (points of entry and exit along streets and highways at the perimeter of the modeling area).

Figure 1 – SCAG Traffic Analysis Zone System

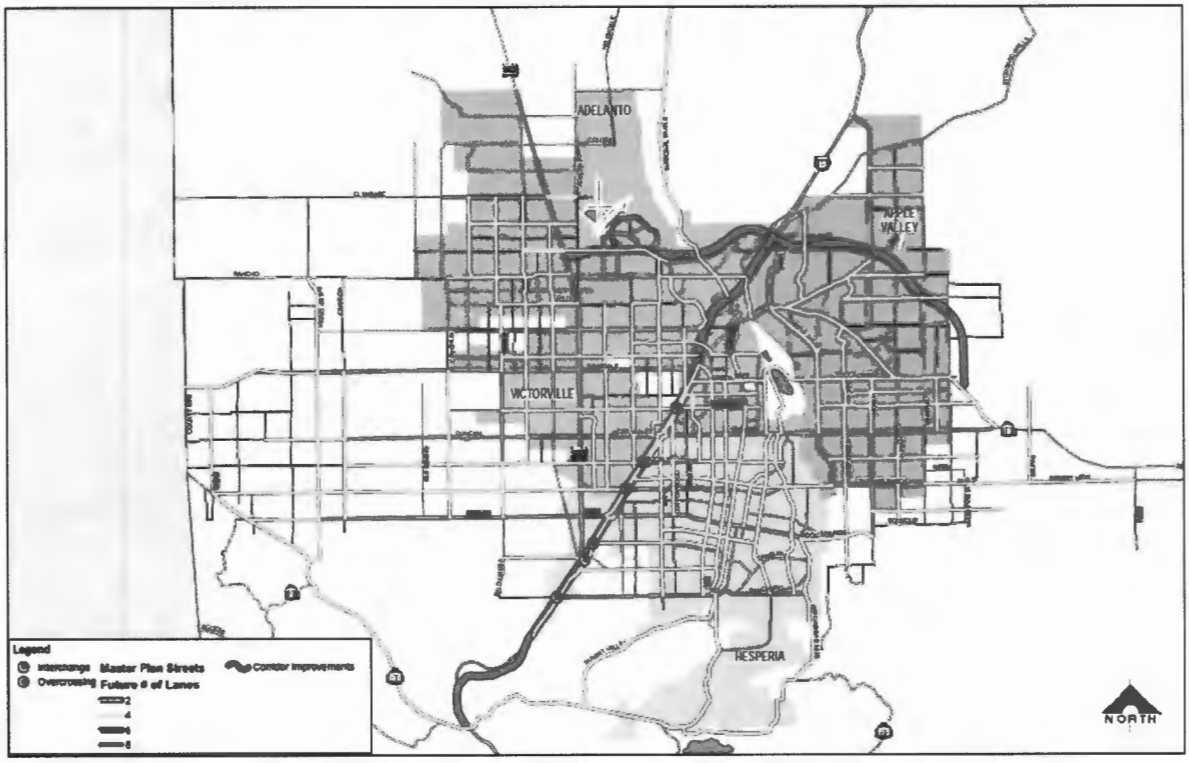


Source: Parsons, 2012; SCAG, Year 2003 Model Validation and Summary: Regional Transportation Model, http://www.scag.ca.gov/modeling

The model zones were further subdivided to improve the quality of the assignments of forecasted traffic to the local circulation system in the Palmdale-Lancaster portion of the High Desert Corridor. Similarly, the more detailed "Recommended Plan for Year 2035" streets and highways set forth in the *Victor Valley Area Transportation Study*,[7] illustrated in Figure 2, was assumed for this traffic analysis. A similar network was assumed as part of the original "High Desert Corridor SR-18 Realignment Traffic Analysis Report" for the East and Apple Valley Segments of the HDC, which was based on the San Bernardino Association of Governments ("SANBAG") sub-regional transportation forecast model developed for the *Victor Valley Area Transportation Study*.

[7] Kimley-Horn and Associates, Inc., March 2008, prepared for San Bernardino Associated Governments (SANBAG).

Figure 2 – Victor Valley Area Transportation Study Recommended Plan for 2035 Key Elements



Source: Parsons, 2012; SANBAG, Victor Valley Area Transportation Study, March 2008.

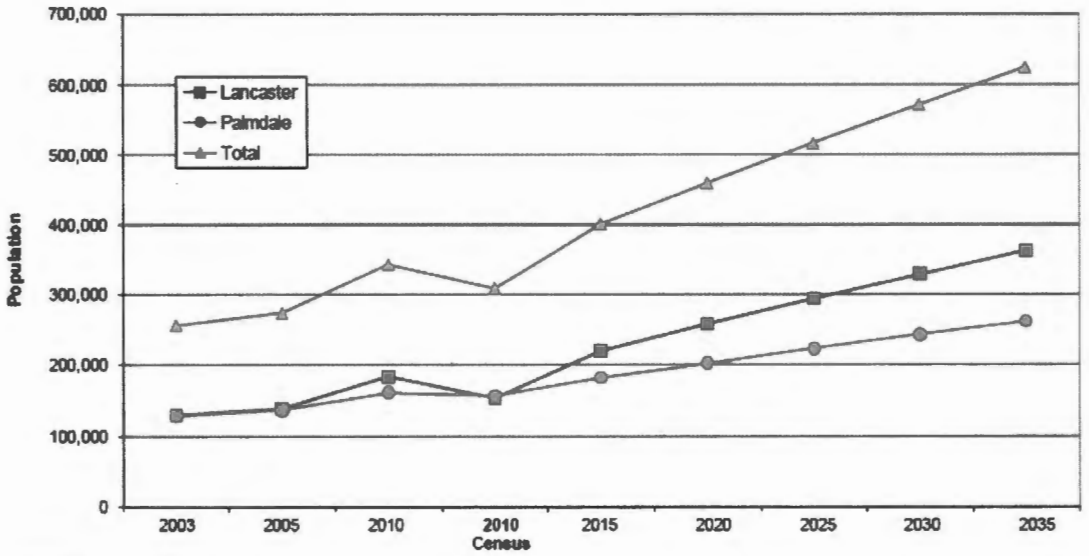
The SCAG Plan 2035 System network reflects highway and transit investments included in the 2008 Regional Transportation Plan ("RTP"). Further adjustments to the local traffic demand distribution and circulation network were made to reflect projected land use plans around the Antelope Valley Mall, the Palmdale High Speed Rail Station and Regional Transportation Center, and the proposed DesertXpress High Speed passenger train in Victorville, and to Distribution Centers heavy trucks (4+axle) trips around the Southern California Logistics Airport ("SCLA") and two regional distribution centers in Victor Valley.

Socio-Economic and Land Use Assumptions

The SCAG *2008 Regional Transportation Plan Growth Forecasts Report* documents demographic planning variables assumptions. These planning variable assumptions were the adopted forecasts of population, households and employment for the SCAG region as of 2011, and are the basis for air quality conformity determinations.

Figure 3 shows as an example the SCAG Adopted 2008 Forecasts for Palmdale and Lancaster.

Figure 3 – SCAG Adopted 2008 Growth Forecasts for Palmdale and Lancaster



	2003	2005	2010	2010 Census	2015	2020	2025	2030	2035
Palmdale	127,548	135,672	160,650	156,633	181,493	202,406	222,761	242,523	261,501
Lancaster	129,181	138,423	182,663	152,750	220,121	257,545	293,971	329,321	363,252
Total	256,729	274,095	343,313	309,383	401,614	459,951	516,732	571,844	624,753
Households									
Palmdale	36,491	38,893	49,143	42,952	58,710	68,791	76,661	84,262	90,516
Lancaster	39,609	41,924	49,331	46,992	56,245	63,532	69,220	74,713	79,233
Total	76,100	80,817	98,474	89,944	114,955	132,323	145,881	158,975	169,749
Employment									
Palmdale	31,132	31,229	35,059	N/A	38,103	40,047	42,332	44,772	47,108
Lancaster	41,112	41,593	49,280	N/A	55,390	59,291	63,878	68,775	73,463
Total	72,244	72,822	84,339	N/A	93,493	99,338	106,210	113,547	120,571

Sources: Southern California Association of Governments, *Adopted 2008 RTP Growth Forecast by City*
2010 Census

Sources: Parsons, 2012; Southern California Association of Governments, *Adopted 2008 RTP Growth Forecast by City*; 2010 Census

Subsequent to the preparation and adoption of the, 2008 RTP Growth Forecast, California's *Sustainable Communities and Climate Protection Act of 2008* (Senate Bill 375, "SB 375") was enacted.

Anticipating the new planning requirements of SB 375, SCAG initiated the Integrated Growth Forecasting process for the 2012 Regional Transportation Plan/Sustainable Communities Strategy ("RTP/SCS") in September 2008, just a few months after the adoption of 2008 RTP. Through the 20-month bottom-up process, SCAG worked with each sub-region and local jurisdiction to reach a consensus on population, household and employment growth between the base year of 2008, 2020 and 2035. This projected growth in population, household, and employment were the basis used to develop the 2012 RTP/SCS and the Regional Housing Needs Assessment. The total regional housing construction needs will be determined by adding replacement and vacancy needs to the projected growth in households for the planning period, recognizing that the State Housing and Community Development Department makes the final determination of SCAG's total regional housing need. The Regional Housing Needs Assessment allocation plan at the city level will be based on the city level totals from the Integrated Growth Forecast for the 2012 RTP/SCS, which may be adjusted based on

considerations of vacancy and replacement needs, as well as shifts in income distribution to avoid the over-concentration of low-income housing units in places where low-income housing are disproportionately high.

As noted above, a draft set of population, household and employment related planning variables has been developed by SCAG for 2008, 2020 and 2035, and circulated for review by local entities. The draft set of planning variables was not adopted at the time Parsons prepared the traffic forecasts for the HDC Freeway Alternative (2011) and Freeway/Tollway Alternative (First Quarter 2012), but it was just recently adopted along with the 2012 RTP/SCS in May 2012.

Much of the work for the 2012 Integrated Growth Forecast has been influenced by the State of California Department of Finance long-range population forecasts.

A review and comparison of the adopted SCAG 2008 RTP growth forecasts, the SCAG Draft 2012 RTP/SCS forecasts, the State of California Department of Finance 2007 long-range forecasts, and the 2010 Census count of population has been undertaken at a county level for the SCAG region. Table 1 presents the results of this comparison. The table indicates the following:

- For the SCAG six-county region, the Department of Finance population forecast for year 2010 is 1,153,165 persons higher than counted during the 2010 Census.
- The delta of 1,153,165 may be subtracted from the Department of Finance horizon year forecasts to approximate interim, revised projections.
- The SCAG adopted 2008 RTP growth forecast for year 2035 is approximately equal to the adjusted Department of Finance for year 2040 (99.94 percent).
- The SCAG draft 2012 RTP/SCS growth forecast for year 2035 is approximately equal to the adjusted Department of Finance forecast for year 2035 (99.28 percent).

At an individual county level, the population comparison results are nearly equal to ±3 percent, as specified by California Government code section 65584.01, given the correspondence observed for the SCAG region as a whole.

Insofar as Los Angeles County, the SCAG adopted 2008 RTP growth forecast for year 2035 is 4.6 percent higher than the adjusted Department of Finance forecast for year 2040. The SCAG Draft 2012 RTP/SCS growth forecast for year 2035 is 3.3 percent higher than the adjusted Department of Finance forecast for 2035.

Insofar as San Bernardino County, the SCAG adopted RTP population forecast for year 2035 is equal to the 96.5 percent of the adjusted Department of Finance forecast for year 2040. The SCAG draft 2012 RTP/SCS population for year 2035 is equal to 93 percent of the adjusted Department of Finance forecast 2035.

Table 1 – Population Forecast Comparison (SCAG Region)

COUNTY	SCAGADOPTED 2008 RTP GROWTH FORECAST		SCAG DRAFT2012 RTP GROWTHFORECAST		CENSUS 2010	DEPARTMENTOF FINANCE 2007 LONG-RANGE FORECAST			
	2010	2035	2008	2035	2010	2010	2030	*2035**	2040
1 Los Angeles County	10,615,730	12,338,620	10,347,644	11,889,867	9,818,605	10,514,663	11,920,289	*12,205,947*	12,491,606
2 San Bernardino County	2,182,049	3,133,801	2,052,929	2,838,320	2,035,210	2,177,596	2,958,939	*3,134,116*	3,309,292
3 Orange County	3,314,948	3,653,990	3,123,253	3,576,235	3,010,232	3,227,836	3,705,322	*3,777,486*	3,849,650
4 Riverside County	2,242,745	3,596,680	2,093,135	3,418,623	2,189,641	2,239,053	3,507,498	*3,805,340*	4,103,182
5 Ventura County	860,607	1,013,753	831,676	978,978	823,318	855,876	1,049,758	*1,092,721*	1,135,684
6 Imperial County	202,270	320,448	177,441	303,136	174,528	189,675	283,693	*309,322*	334,951
Total SCAG Region	***19,418,349***	***24,057,292***	***18,626,078***	***23,005,159***	***18,051,534***	***19,204,699***	***23,425,499***	***24,324,932***	***25,224,365***
Adjusted Totals						18,051,534	22,272,334	*23,171,767*	24,071,200

*Average of 2030 and 2040

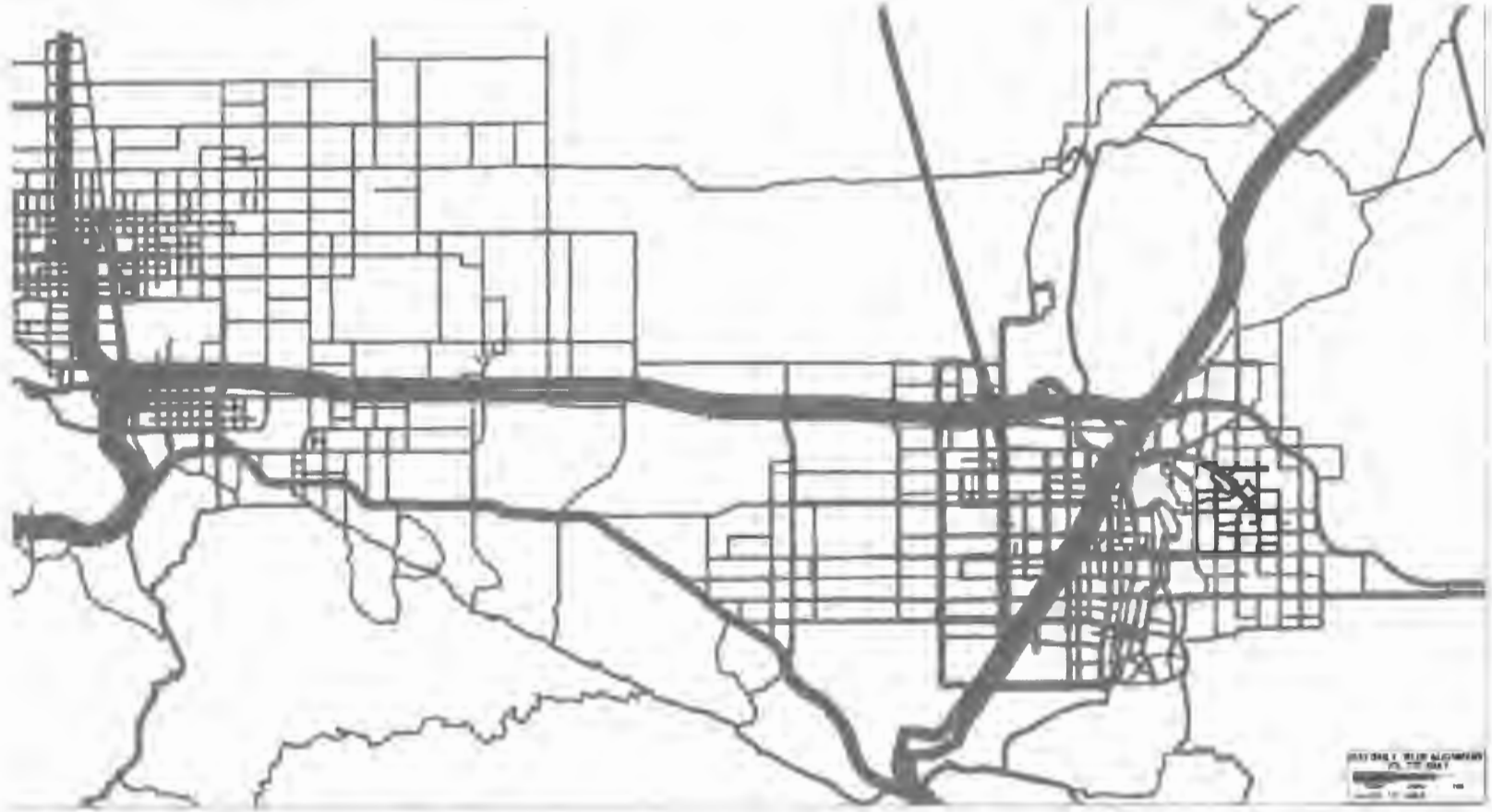
Sources: SCAG, California Department of Finance, 2010 Census, Parsons

Given these findings of forecast consistency, the Advisory Team elected to utilize the SCAG 2008 adopted RTP growth forecast for year 2035 as the basis of the 2040 design year traffic volumes, along with the corresponding year 2035 highway and transit networks which meet air quality conformity determinations. Those forecasts have also been used to prepare the HDC 2020 opening year and 2040 horizon year toll revenue forecasts used in this Business Plan.

Traffic Volumes Forecasts

Figure 4 depicts the 2040 Freeway traffic volumes on the Project and surrounding network.

Figure 4 – 2035 SR-138 New Freeway/Expressway Build Alternative Daily Traffic Volumes on Freeways and Arterial Streets



Source: Parsons, 2012

Methodology for Revenue Forecasting

The SCAG model was used to determine traffic volumes that would use the HDC for various levels of tolls. A toll value was set to maximize revenue. It is worth reiterating that this process is independently applied for each time period, i.e. AM, PM, midday ("MD") and night time ("NT"), to calculate traffic and toll for specific time periods. The average weekday revenue is calculated by a simple sum of revenues for the four time periods.

The SCAG model forecasts average daily traffic ("ADT") only for weekdays. Therefore, in order to estimate traffic and revenue for weekends and holidays, existing traffic patterns on parallel routes were relied upon. In particular, the ratio of average weekday to weekend traffic on the existing East-West routes (Palmdale Boulevard in Palmdale and SR-18 at the County line between Los Angeles and San Bernardino Counties) was used.

Table 2 compares the Toll Alternative traffic volumes at various toll levels per mile toll rate with the freeway alternative traffic volumes. This table shows that as the toll rate increases, so does diversion to alternative routes. The highest revenue forecast is obtained at a toll rate of approximately $0.15 per mile (in 2011$).

Table 2 – Comparison of Alternatives: Traffic Volumes

LOCATION	AM PEAK		MID PEAK		PM PEAK		NIGHT		DAILY	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
NO BUILD ALTERNATIVE										
East Avenue G	2,962	548	2,571	1,633	3,403	5,751	1,112	864	10,048	8,796
El Mirage Road	5,050	1,067	5,573	4,602	4,478	8,684	1,803	1,794	16,903	16,148
HDC—SR 138/SR 18	—	—	—	—	—	—	—	—	—	—
233rd Street East/SR 18	1,929	1,388	3,369	2,772	3,290	2,858	2,117	2,302	10,706	9,320
State Highway 138	5,235	2,072	7,489	6,518	4,723	7,507	5,082	6,473	22,529	22,571
Angeles Crest Highway	2,763	305	3,051	1,748	3,202	4,718	316	393	9,331	7,164
Total	***17,939***	***5,380***	***22,053***	***17,273***	***19,096***	***29,518***	***10,430***	***11,826***	***69,517***	***63,999***
HDC NEW FREEWAY ALTERNATIVE (No Toll, Same Assignment Parameters as Toll Model Runs Below)										
East Avenue G	572	87	349	168	1,010	1,418	161	90	2,092	1,763
El Mirage Road	672	34	172	65	375	2,325	72	20	1,291	2,444
233rd Street East/SR 18	789	213	398	559	635	1,612	200	284	2,022	2,668
State Highway 138	4,158	1,816	6,894	4,696	4,789	6,278	4,759	4,614	20,600	17,404
Angeles Crest Highway	1,436	249	1,161	541	1,595	2,624	226	293	4,418	3,707
Total	***22,649***	***7,756***	***27,402***	***22,040***	***24,841***	***38,167***	***13,272***	***14,854***	***88,164***	***82,819***
SR 138/SR 18 NEW FREEWAY WITH TOLLS ALTERNATIVE (Original Toll Rates: 20 cents per mile autos, 50 cents per mile trucks)										
East Avenue G	2,012	547	2,008	1,570	2,673	3,703	925	936	7,618	6,756
El Mirage Road	3,740	1,469	4,888	4,291	3,605	5,524	2,571	2,663	14,804	13,947
233rd Street East/SR 18	1,737	1,481	2,939	3,243	2,298	2,482	2,548	2,905	9,522	10,111
State Highway 138	4,957	2,311	8,006	6,923	5,312	6,828	5,436	6,598	23,711	22,660
Angeles Crest Highway	2,468	322	2,646	1,325	2,661	3,503	284	374	8,059	5,524
Total	***21,700***	***7,362***	***25,888***	***20,751***	***23,767***	***36,570***	***11,987***	***13,686***	***83,342***	***78,369***
SR 138/SR 18 NEW FREEWAY WITH TOLLS ALTERNATIVE (Revised Toll Rates: 10 cents per mile autos, 25 cents per mile trucks)										
East Avenue G	1,039	318	1,030	682	1,757	2,437	397	378	4,223	3,815
El Mirage Road	2,105	667	2,001	1,324	1,814	3,991	1,030	688	6,950	6,670
233rd Street East/SR 18	1,314	744	1,523	1,605	1,435	2,063	1,336	1,566	5,608	5,978
State Highway 138	4,754	2,141	8,076	6,441	5,263	6,544	5,344	5,978	23,437	21,104
Angeles Crest Highway	1,918	285	1,970	746	2,172	3,082	263	354	6,323	4,467
Total	***22,201***	***7,565***	***26,386***	***21,161***	***24,337***	***37,771***	***12,183***	***13,865***	***85,107***	***80,362***
SR 138/SR 18 NEW FREEWAY WITH TOLLS ALTERNATIVE (Revised Toll Rates: 15 cents per mile autos, 37.5 cents per mile trucks)										
East Avenue G	1,623	469	1,665	1,294	2,199	3,072	893	922	6,380	5,757
El Mirage Road	3,261	1,047	3,776	3,260	2,796	4,661	1,641	1,681	11,474	10,649
233rd Street East/SR 18	1,565	1,043	2,055	2,216	1,816	2,257	2,224	2,623	7,660	8,139
State Highway 138	4,921	2,312	8,029	7,068	5,308	6,866	5,423	6,581	23,681	22,827
Angeles Crest Highway	2,187	304	2,297	964	2,412	3,189	284	374	7,180	4,831
Total	***21,902***	***7,470***	***26,153***	***20,935***	***24,122***	***37,252***	***12,008***	***13,714***	***84,185***	***79,371***
SR 138/SR 18 NEW FREEWAY WITH TOLLS ALTERNATIVE (Toll: 15 cents per mile autos, 37.5 cents per mile trucks, up to 5 min. bonus for HDC toll users)										
East Avenue G	1,171	337	1,078	839	1,829	2,591	673	658	4,751	4,425
El Mirage Road	2,307	809	2,068	1,693	2,058	4,090	1,072	749	7,505	7,341
233rd Street East/SR 18	1,382	824	1,615	1,734	1,546	2,074	1,621	1,859	6,164	6,491
State Highway 138	4,781	2,212	8,104	6,667	5,254	6,517	5,358	6,048	23,497	21,444
Angeles Crest Highway	1,976	287	2,067	797	2,214	2,924	284	373	6,541	4,381
Total	***22,154***	***7,546***	***26,350***	***21,129***	***24,263***	***37,416***	***12,107***	***13,828***	***84,874***	***79,919***

Source: Parsons, 2012

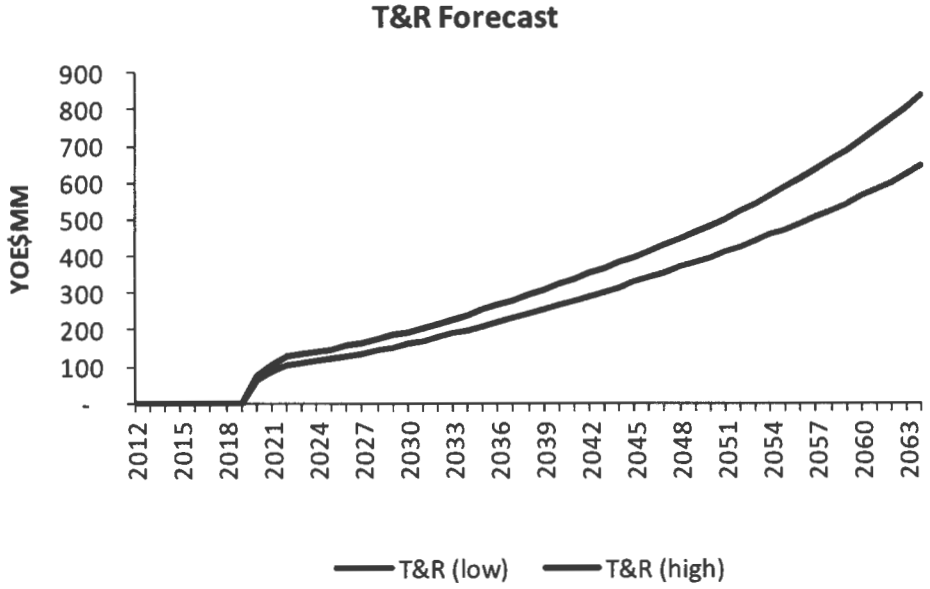
After calculating the annual revenue for 2040 and 2020, the next task was to estimate the same for entire concession period. A logarithmic interpolation was performed to estimate the annual revenues between opening year (2020) and 2040. The annual revenues beyond 2035 were calculated by a simple linear growth based on traffic and VOT growth. Various parameters discussed in this section that are crucial for calculating annual revenue are presented in Table 3.

Table 3– Value of Parameters in Traffic and Revenue Projection

Parameter	Value
VOT Median Passenger cars	
VOT Heavy trucks	$32
CPI	3.0%
Week/Weekend Ratio	1.2
VOT Growth	0 1%
Traffic Growth beyond 2040	1.0%

Figure 5 depicts the 2040 traffic forecast for the Freeway/Tollway Alternative.

Figure 5 – Freeway/Tollway Alternative 2040 Traffic Forecast



Appendix C: Concepts of Toll Operations

Since no public funding was allocated to the Project beyond the environmental phase, tolling of the entire Project from SR-14 to I-15 was initially considered in the Strategic Assessment. Further evaluation based on the more refined traffic and revenue forecasts and sensitivity analysis described in Section 3.2 confirmed the initial assessment conclusions that the most effective delivery option would combine the East and West Segments turned over to Caltrans for operations and maintenance and a tolled Central Segment operated and maintained with performance requirements under a concession contract.

Irrespective of the delivery method of the project, the goals of the Project operations are two-fold:

- To maintain a safe and free flow of traffic through the project at all times.
- To maximize the use of the project while ensuring that tolls are collected from all users.

For the tolled Central Segment, operated by the concessionaire, these goals will be achieved through the combination of:

- Maintenance policies: regular routine and long term preventive maintenance to ensure that the facility is available and in good condition.
- Traffic management: continuous monitoring of traffic 24/7 in order to provide reliable information to customers, to detect any incident which could result in delays, and emergency response teams able to intervene rapidly to restore normal traffic flow as quickly as possible after an incident.
- Tolling policies, described below.

Toll Structure

For over 20 years, Electronic Toll Collection ("ETC") with transponders has been implemented on new toll roads in the US and abroad, replacing toll booths with seamless open road toll collection at highway speeds. California has been on the forefront of this innovation, with the opening of the SR-73 Toll Road and of the all-electronic SR-91 Express Lanes (where transponders are mandatory) in the mid-90's. These projects also included variable tolls, with a fixed toll schedule allowing users to take advantage of lower tolls during off-peak hours and the toll operators to limit demand with higher tolls during peak hours.

The expansion of ETC was followed by the first experience of "variable pricing" on the I-15 HOV lanes in San Diego, converted to High Occupancy Toll ("HOT") Lanes. The variable pricing concept refers to varying tolls not according to a pre-determined schedule, but in a dynamic way, according to real-time traffic volume measured every six minutes, in order to ensure free flow of traffic at all times while maximizing the throughput.

The Project may be a candidate for variable pricing during weekends as traffic volumes increase in the future in order to optimize the use of the project and toll revenues.

Users of the Project will be encouraged to get Fastrak transponders, which are interoperable with all toll facilities in California. It is anticipated that a discount would be offered to drivers with transponders. Over one million transponders are already in use, the majority of them in Southern California, distributed by the Transportation Corridor Agencies ("TCA"), the SR-91 Express Lanes in

Orange County, and the I-15 Managed Lanes in San Diego. Metro's own ExpressLanes project will require the use of these transponders.

Furthermore, considering that the Project traffic will comprise a significant portion of inter-regional travel by non-regular users, video toll collection through identification of the vehicle license plate (or "pay-by-plate") will be offered in order to attract occasional users and interregional traffic not equipped with Fastrak to use the Project. Vehicle owners are then identified through an online link with the California Department of Motor Vehicles (DMV), and a bill is mailed for the amount of the toll due plus a transaction processing fee.

This all electronic mode of toll operation ("AET") without the obligation for users to have a transponder is not currently available on existing toll roads or bridges in California but has been in operation successfully for over 10 years on urban toll roads such as the 407 in Toronto with very high local and interregional traffic volumes (over 300,000 vehicles per day).

Business Rules

The toll applied to trucks could be a multiple of the toll applied to cars, based on number of axles as currently practiced on California toll roads and bridges. Heavy trucks would be required to be equipped with Fastrak transponders specific to their vehicle category. Axle and Height detectors would be installed to identify the vehicle category. Metro's Congestion Reduction Demonstration Program currently under construction on the I-110 and I-10 HOV Lanes (conversion to two express toll lanes in each direction by mid-2013) will provide valuable information on users demand and willingness to pay for faster travel in the region.

Tolls

A detailed toll and fee schedule will be developed during the procurement process for the Project. Toll rates may be reassessed based on marketing studies prior to opening of the Project to traffic. For this Interim Business Plan, tolls assumed for the Central Segment were based on distance traveled within the tolled section of the HDC. The toll rate per mile for passenger cars was determined through sensitivity tests to optimize toll revenues within the range of current toll levels in Southern California (see Section 3.2):

- Passenger cars and light trucks (2-axle): $0.15/mile, i.e. a maximum toll of $4 to $5 for the 31-mile length of the Central Segment from 90th Street to US-395 (and therefore for the entire trip from SR-14 to I-15 since the East and West Segments are not tolled).
- Medium trucks (3-axles): 1.5 x passenger car toll, i.e. a maximum toll of $6 to $7.50 for the entire length of the Project.
- Heavy trucks (4 axles or more): 2.5 x passenger car toll, i.e. a maximum toll of $12 to $15 for the entire length of the Project.
- Pay by plate: Toll + $2 transaction processing fee payable online, by phone or by check.

Enforcement

Enforcement will be effected through the "pay by plate" video detection system (combined with the axle and height detectors for categories other than passenger-cars) used for the "pay by plate": whenever no transponder is detected on the vehicle and the user has not paid the "pay-by-plate" toll (by phone or online) within say 3 days, a violation notice will be sent to the

owner, adding the violation processing fee to the toll amount due. Each violation notice sent to the owner of the vehicle will include an offer to open an account and acquire a transponder.

If no payment is received within 30 days, additional penalties apply, and past due amounts will be sent to collection.

Appendix D: Risk Register

Undertaking a large project such as the High Desert Corridor involves risks throughout the development and implementation of the project. It is critical to identify, manage, and mitigate risks at each stage of the Project.

This section identifies the high-level risks associated with the Project's successful execution and a description of the specific risk mitigation, risk allocation, and risk management approach that Metro will need to apply to each of those risks. This discussion addresses risks associated with each of the general phases of the Project:

- Development, environmental and permitting, ROW;
- Design and construction;
- Operational; and
- Funding, financial commercial and economic.

During the Task 3 Strategic Assessment process, the team prepared risk registers for each of the project delivery alternatives. The registers consisted of a list of potential risks to the successful development, financing, construction and operation of the Project, as well as the effect of each risk, its allocation to Metro or the concessionaire, its probability and its consequence, and the resulting impact. The Strategic Assessment risk registers will continue to be updated during the procurement phase.

A draft term sheet encapsulating the risk allocation plan proposed in the Strategic Assessment will be developed and circulated to the industry for comments during the procurement phase. Legitimate concerns from potential concessionaires will be addressed in order to achieve competitive proposals and prices.

Development, Environmental and Permitting, ROW

Key risks associated with the planning stages of any project include delays due to environmental approvals, litigation, and ROW acquisition. Additionally, authority for tolling and design-build delivery must be approved by the state.

- **Environmental Approvals:** Both the California Environmental Quality Act ("CEQA") and the National Environmental Protection Act ("NEPA") apply to decisions required for implementation of the Project. While the market has shown strong resistance to committing equity to a project before it has obtained environmental approval, procurement can nevertheless proceed in parallel with the final phase of environmental work.
- **Litigation:** The Project has received strong support from local communities to date, however, there is always the risk of litigation under CEQA, NEPA, or both, which has the potential to further delay (or even stop) the Project. FHWA has delegated its lead agency status to Caltrans for NEPA purposes for this Project. As such, litigation under NEPA must be initiated within 180 days of publication of the Record of Decision (ROD) in the Federal Register. While litigation cannot be prevented, the likelihood of success and ability to avoid an injunction can be enhanced by following legal requirements to the letter and carefully documenting the results of the analysis.

- **Right-of-Way Acquisition:** For the Project, there are approximately 2,000 acres of right-of-way (ROW) that must be acquired (2,500 for the alternatives with ROW reservation for future High Speed Rail or for the passenger rail service alternative) and most of this will be needed before construction can begin. As the procurement process advances, an evaluation will need to be made as to the best allocation of risk for ROW cost and schedule. Depending on real estate costs and timing, the responsibility of ROW acquisition could be assigned to either the public sector or the concessionaire.

- **Mitigation:** A large portion of the Project footprint is in rural, undeveloped land and it is anticipated there will be biological impacts which will require detailed mitigation plans which must be implemented prior to starting construction. Identification of protected species or significant impacts could potentially delay the Project.

- **Tolling and Design-Build Authority:** The delivery plan for the Project relies on tolling in the Central Segment to provide a major portion of funding for that segment. State approval to charge tolls and utilize design-build delivery will be required and this discretionary government action introduces one more element of risk in the development phase. This approval should be obtained prior to final procurement and in any event they will be required prior to closing finance for any toll revenue bonds.

There are other, less probable risks that may occur during the development and environmental phase. These include:

- Change in political support for the Project;
- Changes in permitting regulations such as security requirements;
- Changes in the regional transportation plan;
- Major changes in land use plans;
- Shift in public attitude toward the Project and/or tolling; and
- Protests from unsuccessful proposers on the Project.

Funding Risks

As outlined in Section 2.6, the public funding for the Project consists of Measure R revenues, funds transferred from the City of Victorville and San Bernardino County for the environmental phase, potential Measure I funds anticipated to be available after FY 2020, and Highway Strategy Revenues consisting of toll revenues and unspecified State and federal highway funds expected during the LRTP assumed implementation period from FY 2014 to FY 2021. Risks associated with funding from each source include:

- Lack of Measure R and other funds for the capital construction phase of the Project. Measure R revenues and contributions from San Bernardino County and the City of Victorville have been programmed to support only the environmental phase.

- Timing mismatch with implementation schedule. Additional public funding beyond the nearly $50 million already programmed for environmental studies does not become available until after FY 2020, too late for ROW acquisition and/or milestone

payments for final design and construction of the two-end segments between 2014 and 2019.

- Uncertainty surrounding the timing and level of Measure I funds. Estimates vary widely based both on the projected level of sales tax revenues, which have recently decreased due to the economic downturn, as well as the High Desert Corridor's level of priority in relation to other projects competing for Measure I Major Local Highway funds within the Victor Valley subarea.

- Slower than expected future growth and development in the Corridor. The rationale for the Project is based largely on future growth projections rather than existing demand in the corridor. If growth and development levels do not correspond to forecasts, toll revenues supporting project debt could be lower than expected.

- Continued ban on future federal highway earmarks. As Metro's Highway Strategy Revenues and numerous earmark requests by SANDAG and other agencies attest, the project was originally conceived and planned assuming the availability of large federal earmarks to fund key Project elements, such as interchanges. While Metro and its partners have been adept in pursuing innovative funding sources to replace earmarks, an additional commitment of public funding at the federal level will still likely be required to attract P3 investment.

- Diminishing long-term funding streams. Should toll revenues be insufficient to repay capital and operating costs for the facility, the ability to supplement toll revenues with State Highway Account funds and other traditional funding sources for highway operations and maintenance is likely to be constrained by diminishing fuel tax and other revenues at both the State and federal level. A continued lack of national policy consensus over transportation policy could further exacerbate this trend of declining revenues as technological advances create more fuel-efficient vehicles paying proportionately less in fuel taxes per mile driven than today's vehicles.

Financing Risks

Potential risks associated with financing the 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;

- Unanticipated higher costs of debt at the time of agreed pricing;

- Uncertainty surrounding the future market appetite for municipal tax exempt or private financing;

- The expected liquidity of the financial markets, which may be affected by economic factors such as a lack of sustained economic recovery or capacity constraints caused by an over-demand of projects;

- Constraints on alternative financing approaches, including availability of TIFIA and PABs in sufficient quantity to provide capital for the Project at the appropriate time;

- The Project's "greenfield" status, which could make financing more difficult to attract compared to projects that are already part of existing urban highway networks with proven traffic demand; and

- Impact of tolling policy on revenue generation potential and the ability of the project to support debt.

Commercial Risks

Early risks related to the commercial viability of the Project include:

- Shortages in available general and specialized contractors due to the size of the 50-mile Project and simultaneous execution of multiple mega-projects in the Southern California region, resulting in a lack of competitive bids and/or early withdrawal of bidders;
- The complexity of structuring a joint procurement of the end segments and the Central Segment combining different financing sources;
- Inability to obtain specified levels of performance or payment bonds;
- Inability to obtain specified levels of property and liability insurance required for operations
- Volatility in foreign exchange rates, in particular the potential long-term weakening of the U.S. Dollar, which could reduce the financial attractiveness of the revenue streams derived from the Project to multinational contracting firms and infrastructure funds.

There are additional commercial risks associated with the operations phase of a highway toll facility. Actual traffic and revenue on the Central Segment could be lower than the forecast used to obtain concessionaire financing. In the event of lower than expected revenues, the concessionaire will first try to reduce operating costs and/or invest more equity in the project. Inability to meet debt service over the long term could cause bankruptcy, with the facility continuing to operate but the concessionaire losing control of (and its equity investment in) the project.

The SR-125 toll road in San Diego County is an example of a toll concession project which went into bankruptcy. The toll road was ultimately taken over by creditors and sold to the San Diego Association of Governments ("SANDAG") for much less than the debt on the concessionaire's books. SANDAG operates the toll road and collects toll revenues. However, it is important to note that throughout all of these events, the toll road was operated and maintained as planned and the public benefited from the mobility improvements associated with a new highway built decades earlier and at a fraction of the cost than it would have as a public project.

Economic Risks

A key economic risk is the uncertainty surrounding the ability to forecast inflation of costs and revenues over the expected construction phase and operations of the asset. Figure 1 illustrates the Consumer Price Index ("CPI") for the Los Angeles region, California and the United States since 2000.

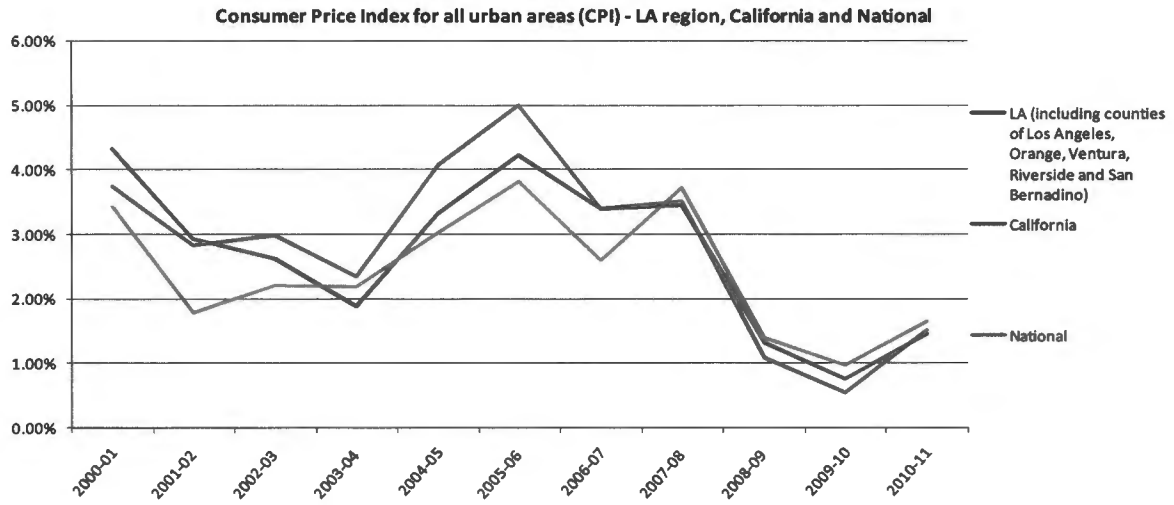
Metro's Measure R program to deliver approximately $40 billion in projects may by itself have a broader impact of increases on labor and commodities prices throughout the region.

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

While there is inflation risk on construction and operating costs, there is also traffic risk on the toll revenue to help recover those costs. The potential revenue from tolls on the High Desert Corridor will be highly dependent on future development in the Antelope and Victor Valleys and to a lesser degree along the corridor. Traffic forecasts are based on anticipated growth in population, housing and employment published by regional planning agencies. These levels of growth can be impacted by the local, regional and/or national economic environment which compounds the risk in the traffic and revenue forecast.

To address this risk, lenders or rating agencies will usually require a financing structure that only requires a portion, e.g. 50%, of the forecast net revenue to cover debt service.

Figure 1. CPI Index for LA Region, CA and National



Source: California Department of Finance data website.

Design and Construction Risks

As with any large project the Project is subject to numerous risks during the design and construction phase.

- **Utility Relocation**. A common schedule risk for freeway projects is relocation of utilities. Utility delays are particularly problematic for projects using a design-build methodology, because of the compressed time schedules for design and construction of the relocations and the transportation facility itself. This risk is naturally reduced on most of the Project outside of the developed areas of Palmdale and the Southern California Logistics Airport ("SCLA") in Victorville. The risk of utility delays can also be significantly reduced by negotiating master agreements with utility owners establishing a framework for design and construction of the relocated facilities, and giving the design-builder as much control over this work as possible. Metro already has master agreements in place with many utilities, as does Caltrans, which should help to expedite the process.

  Due to the nature of the Project, it seems likely that utility costs will not be a major cost driver for the Project. However, even if the cost is relatively small, it will still be a

significant dollar value, and it will therefore be important to create as much certainty regarding the scope and cost of the work as possible. The ability to determine costs in advance is affected by California law prohibiting public agencies from making payments to utility owners for relocations if the agency has a legal right to require the utility to relocate at its own expense. In P3 projects, it is not uncommon for the public agency to transfer responsibility for dealing with utility owners to the P3 partner, with the concessionaire responsible for making payments to utility owners who have prior rights, and for collecting amounts owing from the other utility owners. Regardless of whether the owner or concessionaire is responsible for managing utility payments, it is critical to identify the facilities that may be affected by the Project, in advance of obtaining bids, and also to require the design-builder to undertake appropriate pre-construction surveys to reduce the likelihood of disruption to the construction schedule due to discovery of a previously unknown facility.

- **Delivery Approach**. Projects that rely on toll revenues to provide a portion of their funding are almost always delivered using a design-build approach. With this approach design is always fast-tracked to provide layout details as early as possible so that construction can start while design is being finished. Timeliness of design reviews/approvals is significant risk during this phase. Metro, or its construction manager, will have to track the design review process closely to make sure design comments are provided within the time specified. Metro will need to work with Caltrans to make sure they are prepared to play an appropriate role in the process. Reviewing design and monitoring construction the same way it is done in the traditional design-bid-build approach will result in delay and extra cost to the design-build contractor, followed by claims against Metro. It would appear advisable for Metro and Caltrans personnel who will be involved in monitoring the Project to seek the benefit of lessons learned from other design-build projects such as the Presidio Parkway in San Francisco, as well as from previous Metro/Caltrans projects.

Other risks that are typically transferred to the concessionaire are the adequacy of the design, issues related to the design-construction interface and typical construction risks such as performance, material and labor availability, site safety and security, etc. These can be significant risks and assignment to the concessionaire who has control over these items is one of the main advantages of a P3 approach. During the execution of the contract Metro and Caltrans need to take care not to require changes to the design concept upon which the Project was bid. This may result in transfer of cost and schedule risks back to Metro that was transferred contractually to the concessionaire. Similarly, Caltrans and Metro should oversee construction in accordance with the contract documents. Intervening in construction activities or involvement to the level normally used in design-bid-build construction can delay the contractor and result in needless claims.

Operations Risks

The operations and maintenance of the Central Segment of the Project will be the responsibility of the concessionaire under a fifty-year concession. This discussion focuses on the risks associated with the Central Segment only. The East Segment and the West Segment will have been turned over to Caltrans at the time of completion, to operate and maintain as part of the state highway network. The risks on these segments are not relevant to this business plan other than the risk they could be closed due to an accident or major event such as an earthquake or landslide. In that event, traffic and revenue on the tolled Central Segment would be reduced or temporarily halted. The operating plans for the entire corridor will need to consider this risk and provide for quick response and repairs or detours around blockages that will take time to remove.

For the private operator of the toll road segment an additional set of risks will be faced. These can be either operational or related to maintenance of the facility and systems. The most likely operational risk is lower traffic and revenue than forecast. That risk was discussed under commercial and financial risks. However, other operational risks may impact revenue. Failure of the toll collection system and/or vehicle license plate readers can also result in lost revenue.

- **Operations Risk**. A higher than anticipated percentage of violations would increase operating cost due to additional staffing for violation processing and would also reduce revenue. Most of this risk can be mitigated by the ability to recover lost revenue and additional processing costs through an efficient video enforcement system and violation penalties. However some residual risk remains with the private operator since a percentage of the violators may never be identified, or if identified, tolls, penalties and administrative costs never collected. Other risks during operation that can impact revenue and operating costs include safety related issues, hazardous waste spills, excessive debris removal requirements and flooding. In Southern California, earthquakes are an ever-present risk. To obtain reasonable proposals for a P3 on the Project, the P3 agreement will need to include provisions allowing appropriate relief for major force majeure events such as earthquakes.

- **Maintenance Risk**. Under a P3 the concessionaire will carry out roadway maintenance such as debris removal and cleaning as well as routine maintenance of the facility, toll collection system and traffic management system. The concessionaire will also be responsible for scheduling and conducting long-term capital maintenance and rehabilitation. The cost of either routine or capital maintenance may be higher than planned, but failure to perform required maintenance can be even more costly over the long run. For a project developed through a P3 approach, the concessionaire will be responsible for maintenance risk, unlike a publicly controlled and operated facility. On the Central Segment, this shifts a significant amount of risk from the public sector to the concessionaire. Metro's and Caltrans' role would be to monitor these activities to make sure the terms of the concession agreement, or comprehensive development lease agreement ("CDLA"), are adhered to and the roadways remain safe for the traveling public.

  If the Central Segment were delivered through a traditional design-bid-build or a public design-build approach, the public agency that owned the facilities would be responsible for maintenance and operation. The agency would be required to have another source of funding to pay operating costs, maintenance costs and debt service for construction bonds should any of these costs exceed plan or revenues be reduced due to unplanned incidents.

Appendix E: Inputs to Financial Analysis

Capital cost – Central Segment		
In millions $	**Real**	**YOE**
Design, Management, and Surveys	66	77
Construction Monitoring	32	39
Environmental Mitigation	37	51
ETC	23	33
Roadway (including utilities)	707	957
Structures	42	58
ROW	167	190
Total Capital Cost – Central Segment	1,074	1,405

Capital cost – East and West Segments		
In millions $	**Real**	**YOE**
Design, Management, and Surveys	64	71
Construction Monitoring	37	43
Environmental Mitigation	42	54
ETC	-	-
Roadway (including utilities)	588	769
Structures	263	333
ROW	158	178
Total Capital Cost – East and West Segments	1,152	1,448

O&M Central Segment (2020-2064)		
In millions $	**Real**	**YOE**
Total O&M	486	1,306

Capital maintenance		
In millions $	**Real**	**YOE**
Pavement	168	567
Structures	10	27
Drainage	27	81
Toll Systems	80	221
Traffic Systems	59	179
Total Capital Maintenance	344	1,075

Toll Revenue (low forecast)		
In millions $	**Real**	**YOE**
Auto Toll Revenue	3,840	11,017
Truck Toll Revenue	933	2,677
Total Toll Revenue	4,773	13,693

Toll Revenue (high forecast)		
In millions $	**Real**	**YOE**
Auto Toll Revenue	4,393	12,696
Truck Toll Revenue	1,464	4,231
Total Toll Revenue	5,857	16,927

Appendix E – Inputs to Financial Analysis

Terms Sheet

Financing terms	Scenario 1: High subsidy	Scenario 2: Low subsidy
Analysis term	50 year concession	50 year concession
Inflation	Construction: 4.79% O&M, Lifecycle, and Revenue: 3%	
Senior debt facility	**Private Activity Bond (PAB)**	
Interest rate	5.75%	5.25%
Tenor	30 year issue	
DSCR	Min: 1.75x	Min: 1.50x
Repayment	Last 20 years of tenor, level debt service	
Fees	Arrangement fee: 1.5% Agency fee: $100,000 (real)	Arrangement fee: 1% Agency fee: $100,000 (real)
Subordinate debt facility	Not included	TIFIA (see below)
Target gearing	70:30 debt to equity	80:20 debt to equity
Target post tax equity rate of return	15%	13%
Facility type	**TIFIA loan**	
Interest rate	N/A	3.32%
Tenor	N/A	40 year loan
DSCR	N/A	1.25x
Repayment	N/A	5 year interest holiday 20 year principal holiday
Fees	N/A	Arrangement fee: $450,000 Agency fee: $12,000 (2011$)

ATTACHMENT B

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

Public-Private Partnership Feasibility Evaluation

High Desert Multipurpose Corridor

Prepared by
INFRACONSULT LLC

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Chris Margaronis
Sharon Greene & Associates
Nossaman LLP

FINAL
December 2012

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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.

EXECUTIVE SUMMARY

Objective

The purpose of this study is to augment the High Desert Corridor ("HDC") Interim Business Plan with analysis of other development opportunities in the corridor, including first and foremost high-quality passenger rail service, water conveyance, electrical transmission, and energy generation through wind and solar technologies.

Completed in June 2012, the Interim Business Plan ("IBP") considered only a highway facility extending 50 miles from SR-14 in Palmdale to I-15 in Victorville, and estimated the likely range of additional public funding required to construct this project assuming its delivery as a public-private partnership ("P3"). The analysis in the IBP concluded that toll revenues would be adequate to cover some but not all of the project's capital costs with an upfront subsidy of at least $1 billion YOE required during construction. The objective of this analysis is to assess the net financial impact of adding passenger rail and other potential uses to the HDC project. The various alternatives incorporating other potential uses with a highway facility are referred to in this study as the High Desert Multipurpose Corridor ("HDMC").

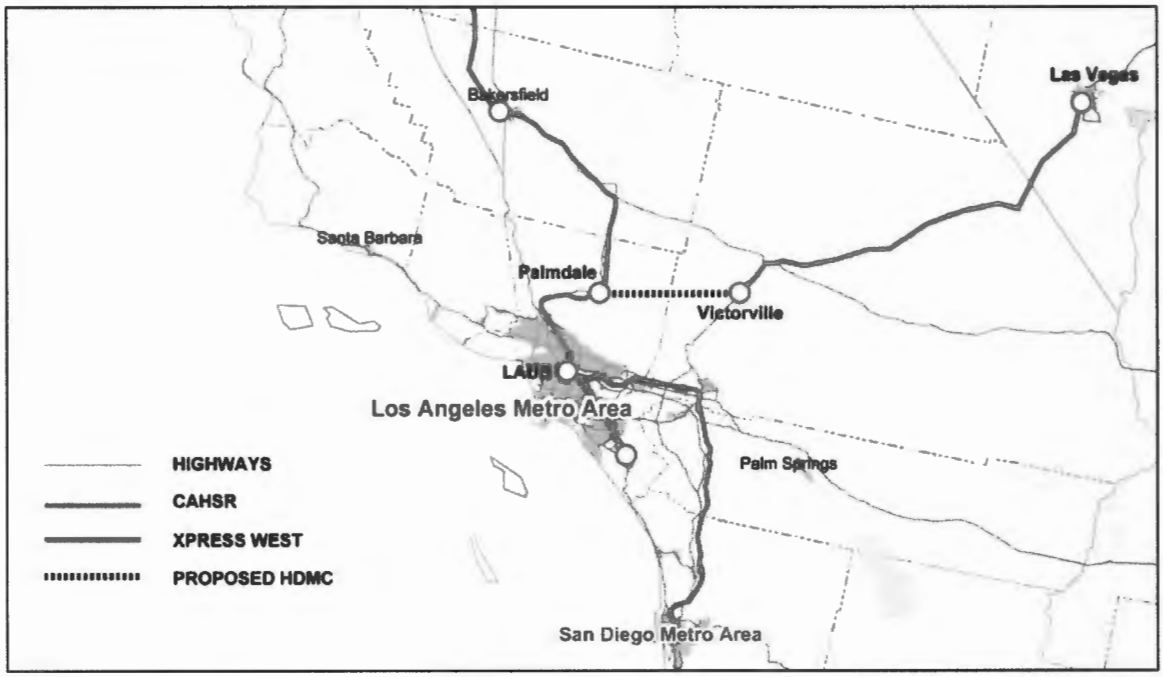
Project Definition

The primary components of the HDMC are a freeway/tollway between State Route 14 ("SR-14") in Palmdale and Interstate 15 ("I-15") in Victor Valley and a passenger rail service between Palmdale and Victorville.

The freeway/tollway component of the Project, or HDC, is a new 50-mile 4 to 8 lane facility extending from SR-14 in Palmdale to I-15 in Victorville. The project is divided into three segments: West (9 miles), Central (32 miles), and East (9 miles). All three segments would be procured under a single P3 contract package. The East and West segments would be completed as freeway and handed over to Caltrans upon completion, with the Central segment being operated as a toll road and maintained by a concessionaire over a defined contract term.

This passenger rail component of the HDMC would operate as a new high-speed rail corridor r from the existing Metrolink terminus in Palmdale to Victorville. As shown in **Figure ES-1**, the significance of the HDMC would be to provide a critical missing interregional rail link between two major infrastructure investments currently in the planning stages in Southern California: 1) the California High Speed Rail ("CAHSR") link between Los Angeles and the Central Valley, and 2) the XpressWest corridor between Victorville and Las Vegas. The XpressWest (formerly known as the DesertXpress) is a proposed privately-funded dual-track high speed passenger train with operating speeds up to 150 mph from Victorville to Las Vegas.

Figure ES-1 – Regional Reference Map



This study analyzes two basic alternatives for the HDMC: a "one-seat," and a "two-seat ride between Los Angeles Union Station ("LAUS") and Las Vegas:

1) **One Seat Ride**. The concessionaire would operate continuous "one-seat" ride at an average operating speed of at least 150 mph from LAUS through Victorville and retain all passenger rail revenues associated with the entirety of the route. There would be an intermediate stop in Palmdale, and potentially at Burbank and Santa Clarita. This scenario includes the additional cost of purchasing, operating, and maintaining additional trainsets (Electrical Multiple Units ("EMU")) necessary to accommodate rail service between LAUS and Palmdale as part of a continuous journey between Los Angeles and Las Vegas. For purposes of this analysis, the concessionaire is also assumed to operate the 32-mile tolled segment of the HDC highway facility between Palmdale and Victorville.

2) **Two Seat Ride**. The concessionaire would operate service only as far as Palmdale. Passengers originating their trips in the Los Angeles metropolitan region are assumed to access the Palmdale station either via auto or existing Metrolink service, which operates conventional rail service from LAUS. The concessionaire is also assumed to operate the 32-mile tolled segment of the HDC highway facility between Palmdale and Victorville.

   An Enhanced Two-Seat Ride was also analyzed which assumed the existing LAUS to Palmdale corridor would be upgraded to high speed rail standards in accordance with the CAHSR's plan, with improvements allowing for faster operation of rail service between Los Angeles and Palmdale, where passengers are assumed to have a convenient cross-platform transfer to Victorville-bound high speed trains. The enhanced transfer and higher speeds would reduce travel times and attract an increased level of ridership from the Los Angeles Metropolitan area compared to the basic two-seat ride scenario. As with the basic two-seat ride scenario, the

concessionaire would also operate the 32-mile tolled segment of the HDC highway facility between Palmdale and Victorville.

In addition to passenger transportation alternatives for the corridor, this study also explored other ancillary corridor uses including water conveyance, electrical transmission, and energy generation through wind and solar technologies.

Project Costs

Presented in **Table ES-1**, capital costs for the highway component of the project have been estimated based on Caltrans data assuming a single design-build construction contract for the three segments, totaling slightly more than $2.2 billion in 2011 dollars ($2.6 billion YOE), including $476 million in pre-development costs ($520 million YOE) that would be retained by the public sector, for a net capital cost to be financed by the Concessionaire of approximately $1.7 billion. Capital costs for the rail component were estimated at $1.6 billion ($2.0 billion YOE) for the Palmdale to Victorville segment.[1]

This analysis assumes that track improvements required to make the Palmdale to Los Angeles segment suitable for high speed service will be publicly funded in accordance with the California High Speed Rail Authority ("CaHSRA") Business Plan. The capital costs attributed to the Concessionaire do include, on the other hand, $680 million in additional trainsets and train system improvements needed to operate high speed rail between Palmdale and Los Angeles under the "one-seat" ride scenario.

Capital costs for the solar energy component (approximately $90 million) were based on available industry sources as discussed in the energy section of this report.

Table ES-1 - HDMC Capital Costs and Cost Allocation by Element

HDMC Project Element In Millions, 2011 dollars	Total Capital Cost	Cost Retained by Public Sector	Cost Attributed to Private Partner(s)
Palmdale – Victorville Highway	2,243	476	1,724
Palmdale - Victorville Rail Corridor	1,604	0	1,604
Los Angeles - Palmdale Rail Corridor			
Trainsets & Systems	680	0	680
Track Improvements	TBD	TBD	0
Solar Energy Corridor	90	0	90
TOTAL	**4,527**	**476**	**4,028**

Operations and maintenance ("O&M") costs estimates for the rail service between Los Angeles, Palmdale, and Victorville were estimated for each segment (Los Angeles to Palmdale and Palmdale-Victorville) in 2025, based on unit costs for train operations, infrastructure maintenance, stations maintenance (including sharing of maintenance costs for the Palmdale station with Metrolink and the California High Speed Rail Authority), insurance and administration. The O&M cost estimate does not include any potential track access fees for the use of the Los Angeles to Palmdale segment. Opening year annual O&M costs for the rail

[1] Capital cost estimates for the rail component are derived from the California High Speed Rail and other available rail cost estimates.

component were estimated to be approximately $56 million for the Palmdale to Victorville segment and $62 million for the Los Angeles to Palmdale segment expressed in 2012 dollars.

Under a P3 delivery, O&M cost estimates for the tolled Central Segment would be retained by the concessionaire, while the East and West Segments are assumed to be turned over to Caltrans at the completion of construction. Replacement and major rehabilitation costs for all components of the project were also considered on a lifecycle basis in the financial model and assumed to be the responsibility of the Concessionaire.

Project Revenues

For the rail revenue component, the key assumptions for the ridership and revenue forecast rely on studies undertaken for the proposed XpressWest rail project (previously known as DesertXpress). Most noteworthy is a comprehensive study completed by URS Corporation in 2005. The URS Study was performed as part of the EIS for the DesertXpress project. The assumptions obtained from the URS Study were augmented by information and data, both qualitatively and quantitatively, from the following three sources:

- DesertXpress Ridership Forecast Review prepared by Cambridge Systematics Inc. (2005)
- DesertXpress Ridership and Revenue Audit prepared by Steer Davies and Gleave (2007)
- Las Vegas to Los Angeles Rail Corridor Feasibility Study prepared by IBI Group (2007)

The three fundamental inputs derived from the above studies include the size of travel market between Southern California and Las Vegas, the capture rate of XpressWest, and the growth parameters. It is important to note that for this study no new data collection or model development was undertaken and inputs from existing studies by peers were taken as is and or extrapolated as noted.

Ridership was estimated for the one-seat, two-seat and enhanced two-seat ride scenarios and is presented in **Table ES-2**. Round trip fares utilized were approximately $50 (2012 dollars) from LAUS to Victorville under the one-seat ride scenario. Under the two-seat ride scenario, the fare utilized from Palmdale to Victorville was approximately $20 (2012 dollars). Fare assumptions for the rides were based on comparable per mile rates as XpressWest.

The level of incremental passenger revenues accruing to other operators such as CaHSRA and Metrolink under the "enhanced" two-seat ride was also calculated and included in **Table ES-2.** This revenue was not used as an input to the financial model but instead is provided to demonstrate the potential for revenue generation in the upgraded Los Angeles to Palmdale segment as a result of the implementation of HSR service between Palmdale and Victorville which would accrue to the operator of that service.

Financial analysis of the multimodal corridor also includes gross toll revenues for the highway facility. These revenues are based on the "base case" Traffic and Revenue ("T&R") forecast developed by Parsons Transportation Group ("PTG") for Los Angeles County Metropolitan Transportation Authority ("Metro"). This analysis assumes no modification to "base case" toll revenues resulting from the addition of rail service along a coterminous route - an assumption that should be tested in subsequent assessments of the multimodal corridor concept.

Table ES-2 - HDMC High Speed Rail Gross Revenues

Scenario	Average annual revenue	Total Gross Revenue (thru FY 2064) (millions)	
	2012$	2012$	YOE
One-Seat Ride	$368	$15,672	$44,955
Two-Seat Ride	$82	$3,482	$10,035
Enhanced Two-Seat Ride	$124	$5,259	$14,638
Incremental LA to Palmdale Revenues Under "Enhanced Two Seat Ride"	$149	$6,550	$18,225

Financial Analysis

At this early stage of the HDMC ("Project") development, the financial analysis focused on the implementation of the Project as a concession, and, if necessary, an upfront construction subsidy provided to the Concessionaire with an assessment of net revenues from the Project accruing to the concessionaire during operations. This analysis uses the concession structure to calculate the minimum level of public investment required to make the Project financially viable under a range of scenarios; at present, it is neutral with respect to the issue of revenue risk transfer and whether an availability payment model (in which the public sector retains revenue risk) may be more suitable for the Project.

The highway-only scenario shown in **Table ES-3** below provides a benchmark against which to compare the subsidy requirements of the three alternatives under consideration.

Table ES-3 - Comparison of Private Financing Capacity and Construction Subsidy Required for Capital Costs, by Project Scenario

Sources of Funds	One Seat	Two Seat	Enhanced Two Seat	Highway Only
Private Activity Bonds	-	-	-	824
TIFIA Proceeds	2,861	1,946	2,305	789
RRIF Proceeds	1,349	585	1,039	0
Equity	1,212	360	615	315
Interest Income	89	54	69	29
Total Private Financing	***5,511***	***2,945***	***4,028***	***1,957***
Construction Subsidy	***0***	***1,492***	***525***	***607***
Total Capital Cost	**5,511**	**4,437**	**4,553**	**2,564**
Construction costs	4,999	4,147	4,147	2,166
Financing costs	512	289	406	398
Debt to Equity Ratio	78:22	88:12	84:16	81:19

Under the one-seat ride scenario: total project revenues from the multimodal corridor are robust enough to support a P3 concession without any public funding contributions during construction or operations (Metro would still retain costs of $520 million YOE associated with pre-development activities, right-of-way ("ROW") acquisition, and construction monitoring). The financing

capacity provided by rail revenues under this scenario appears sufficient to cover not only the capital, operating, maintenance, and lifecycle costs associated with the rail corridor, but the entirety of the capital funding gap range identified for the HDC in the HDC Interim Business Plan. Over the term of the concession, the private equity investment of $1.2 billion would achieve a pre-tax internal rate of return ("IRR") of just over 16%.

Under the two-seat ride scenario: passenger fare revenues are sufficient to cover O&M and lifecycle costs during operations, but insufficient to finance all of the capital costs. An additional upfront construction subsidy of approximately $900 million for the rail component would be needed (represented in **Table ES-3** by the difference between the $1.5 billion subsidy for the HDMC two-seat ride and the $607 million subsidy for the HDC Highway Only scenario). This will translate to a total upfront construction subsidy of approximately $1.5 billion to deliver a multimodal corridor (highway and rail). The subsidy would be used to buy down the capital cost of the Project, reduce private financing requirements, and provide a pre-tax equity IRR of 14% to the Concessionaire during operations.

Under the enhanced two-seat ride: the multimodal corridor would require a public subsidy of $525 million, slightly lower than the $607 million required for the highway-only scenario. Hence the rail component appears to cover all of its own costs, including capital, O&M, and lifecycle, but its self-sufficiency is reliant on highly favorable financing terms, specifically the availability of Transportation Infrastructure Finance and Innovation Act ("TIFIA") and Railroad Rehabilitation & Improvement Financing "RRIF" program loans in an unprecedented amount ($3.3 billion YOE) and at current historically low interest rates. The enhanced two-seat ride may slightly reduce the subsidy needed for highway (by less than $100 million). The enhanced financing capacity achieved by adding rail to the corridor is the result of three factors:

- The additional robust revenue stream generated by rail service in the corridor connecting the XpressWest service from Victorville to Las Vegas with high speed rail service in the CaHSR corridor through Palmdale.
- Under a tolled highway facility-only project definition, the HDC is eligible only for the TIFIA program and is ineligible for RRIF. Combined as a single project, the toll facility and passenger rail service can take advantage of both TIFIA and RRIF, thereby substantially increasing the eligible amount of project financing that can be obtained with federal credit assistance (ie. at below-market interest rates);
- The addition of the rail project enhances the opportunity to take advantage of the higher level of TIFIA financing to implement a multi-modal, energy-efficient corridor. Assuming the one-seat ride scenario, with service from Los Angeles to Victorville as part of a service continuing to Las Vegas, excess net operating income could allow for the issuance of additional debt to cross-subsidize the construction costs of the tolled highway facility as well as allowing for the contribution of additional private equity, which can be similarly repaid (with appropriate risk-adjusted returns) out of net revenue streams generated from the rail project.

Conclusions

The fundamental conclusion of this analysis is that the addition of high-quality, high speed passenger rail service enhances the overall financial viability of a HDMC Project, assuming that the proposed XpressWest service is implemented between Victorville and Las Vegas and achieves the forecasted level of ridership. In fact, if a one-seat ride from Las Vegas is provided to LAUS along the future CaHSR alignment planned between Los Angeles and Palmdale (and subject to the assumptions identified below), the resulting multimodal transportation corridor

from Palmdale to Victorville could be self-financed and self-supporting based on combined highway toll revenues and fare revenues from rail service.

Fare revenues under a two-seat ride scenario utilizing Metrolink service for the connection between Los Angeles and Palmdale are less robust and would increase the total construction subsidy required to deliver the multimodal corridor by approximately $900 million over that required for the highway only (HDC) scenario. However, it should be noted that even at this higher subsidy level, new HSR service between Palmdale and Victorville could be delivered at a lower overall cost to the public sector under a multimodal P3 delivery approach compared to the delivery of HSR service as a standalone, publicly-funded project.

The results for the "enhanced two-seat" ride scenario demonstrate that the connection between Los Angeles and Palmdale will be a critical generator of ridership and revenue for the Project. If this segment can be improved to provide high speed rail service levels as contemplated by the CaHSRA, the HDMC becomes much more viable as a self-financed project. In addition, the potential synergistic network impacts of adding HSR service between Palmdale and Victorville on the Los Angeles to Palmdale corridor could justify the negotiation of a revenue-sharing agreement between CaHSRA and the HDMC concessionaire, with some of the incremental revenues generated from HDMC-induced ridership pledged to support HDMC project costs.

This study also concludes that there is potential for the corridor to be self-sufficient in terms of energy generation, with solar energy developed in the corridor sufficient to power the trains and the electrical needs of the highway facilities. Such solar energy would reduce the operating cost of the trains by providing electrical energy approximately 20% more cost effectively than traditional sources (see **Section 2.4**).

Also, considered cost-effective, although not a major contributor to the financial viability of the overall project, are the development of a high voltage electrical transmission line through the length of the corridor and the development of an auto oriented rest area/plaza[2] approximately midpoint in the corridor. Other options were considered in this analysis but found unlikely to be cost effective, including a water conveyance system from the Mojave Aquifer intersected by the Corridor at its eastern end and linear wind turbines in the corridor.

Table ES-4 presents the components of the High Desert Multipurpose Corridor Project, which eliminates the capital funding gap during construction[3] under a "one-seat" ride scenario. (Metro would continue to retain costs associated with ROW, environmental, etc. estimated at approximately $520 million).

[2] Revenues from a transmission line or the rest area were not developed in the analysis.
[3] High Desert Corridor Project Interim Business Plan, InfraConsult, June 2012

Table ES-4 – Components of HDMC

Project Component	Self-Financing	Contribution to Funding Gap Reduction
West Segment of Highway Corridor	NO	NONE
East Segment of Highway Corridor	NO	NONE
Central Segment of Highway Corridor	YES	MINIMAL to NONE
Rail Service in Corridor: 1 seat ride LA Union Station to Las Vegas	YES	STRONG*
Rail Service in Corridor: 2 seat ride LA Union Station to Las Vegas	NO	NO**
Rail Service in Corridor: Enhanced 2 seat ride LA Union Station to Las Vegas	YES	<$100M**
Solar Energy Development in the Corridor	YES	LIMITED***

*On the order of $1.0 billion

** see explanation above about the enhanced potential for obtaining a 49 percent share of TIFIA through a multimodal approach. Also, this scenario generates substantial revenue for the operator of the service between LAUS and Palmdale which is not included in the financial analysis for the Palmdale to Victorville segment.

*** see explanation above about the potential for reducing the operating cost of the trains by providing electrical energy approximately 20% more cost effectively than traditional sources

The feasibility evaluation undertaken herein is based on existing data and information, combining information and extrapolating as necessary to fill in gaps in the data. Additional analysis will be required as part of the procurement strategy phase for the project. The key assumptions upon which these conclusions are based include the following:

- **Accuracy of ridership and revenue forecasts**, which are modeled upon the Victorville to Las Vegas XpressWest rail service and were developed by some of the most reputable firms in the business (see **Section 4.2** of this report). Should the forecast levels of ridership fail to materialize for XpressWest, the financial viability of the HDMC would be proportionately impacted.

- **Assumption of the cost of track improvements for the Los Angeles - Palmdale corridor by the CaHSRA**[4]. If CaHSRA funding is unavailable, the excess financing capacity from the rail service would not be available to support construction of the East and West segments of the High Desert Corridor highway facility.

- **Availability of TIFIA and RRIF loans up to the statutory program maximums.** Given the total capital cost of the Project at over $4.0 billion, the amount of these loans would be unprecedented in size (See **Section 4.3** of this report). In addition, Metro's current policy is to seek a 33% share of TIFIA for its highway program, not the 49% share assumed in this financial analysis. That said, the Consultant Team believes a strong case could be made for seeking the maximum 49% TIFIA share for the HDMC based on its multimodal character, innovative integration of clean energy components to power train

[4] California High-Speed Rail Program Revised 2012 Business Plan, April 2012

operations, and overall economic development potential for the Antelope Valley / Mojave Desert region in Southern California.

- **Adequate market appetite for the level of equity participation required in a revenue risk, greenfield project** (See **Section 4.3** of this report).

- **Availability of early public funding for at least $520 million YOE in pre-development costs** (comprising ROW, environmental, planning etc.)

1.0 OVERVIEW

1.1. Purpose of this PPP Evaluation Study

Historically, the Los Angeles County Metropolitan Transportation Authority ("Metro") has delivered large infrastructure projects using "traditional" delivery methods (i.e. design-bid-build "DBB" or the "public delivery option"). Metro has determined that public-private partnerships ("P3"), delivery programs based on active and collaborative private sector participation, have the potential to facilitate delivery of critical projects more efficiently, quickly and cost-effectively.

In June, 2012, an Interim Business Plan ("IBP") was completed to estimate the likely range of additional public funding needed for the High Desert Corridor Highway Project ("HDC Project"), assuming that this project is delivered as a P3, and to recommend next steps in the procurement process. The Interim Business Plan analyzed this project as a toll concession with an upfront construction subsidy as a conceptual financing structure. The findings were that while the Central Segment of the project was potentially self-financing, the East and West Segments would require public funding in excess of $1 billion. The purpose of the High Desert Multipurpose Corridor study ("HDMC Project") is to augment the HDC Interim Business Plan with the consideration of other opportunities in the corridor. Most notably among the options is a high quality passenger rail serving to connect the proposed XpressWest rail service (formerly known as DesertXpress) to the rail corridor extending northeast out of Los Angeles. XpressWest is currently planned to serve between Victorville and Las Vegas. The rail connection serving areas northeast of Los Angeles to Palmdale and Lancaster is currently provided by Metrolink and is on the proposed California High Speed Rail ("CaHSR") service corridor between Los Angeles and San Francisco. In addition, this study also considers potential opportunities in the corridor as solar and wind energy generation, electrical transmission and water conveyance, converting this transportation corridor to a truly multi-modal one.

This feasibility evaluation undertaken herein is based on existing data and information, combining information and extrapolating as necessary to fill in gaps in the data. Additional analysis likely will be required as part of the procurement strategy phase for the project while additional technical, cost, and traffic/ridership data is developed for the environmental evaluation of the various project alternatives.

1.2. Delivery Options Considered

Three possible P3 approaches to build the highway project from SR-14 to I-15 were initially considered in the Strategic Assessment[5] for the HDC Project:

- Design-Build-Finance-Operate-Maintain ("DBFOM") either for the entire HDC Project or for the most financially feasible portion of the HDC Project. Traffic revenue risk under this scenario could: a) fall entirely on the concessionaire; b) be shared between Metro and the concessionaire; or c) fall entirely on Metro who would compensate the concessionaire through an availability payment ("AP") structure.
- Design-Build ("DB") for the two end connections of the HDC Project (from SR-14 and from I-15), where tolling would be impractical or insufficient to fund a substantial portion of the

[5] Public-Private Partnership Program – Recommendations for Business Case Development

initial capital cost. The public sector would be responsible for operations and maintenance upon completion of construction.

- Pre-Development Agreement ("PDA"), with early involvement by the concessionaire in the design and development of the HDC Project. The public sector would retain responsibility for environmental studies and obtaining a Record of Decision ("ROD"), but prior to the ROD, the concessionaire would be selected and subject to cost rates, with final price negotiated after the ROD.

The Strategic Assessment considered each delivery option for the HDC Project against the following evaluation 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.

The DB option would transfer key design and construction to the concessionaire and as such would likely lower the capital costs of the HDC Project compared to a traditional DBB delivery; however, it would not achieve lifecycle efficiencies associated with the long-term operations and maintenance of the Project. Most critically, this option was not evaluated further as it would not provide any additional financing capacity or private equity investment through the leveraging of toll revenues. Given the lack of upfront available public funding for the HDC Project, such investment was deemed essential to implementation.

The PDA option for the freeway/tollway project also merited consideration by the Public-Private Partnership Advisory Team ("P3 Advisory Team"), as it would shorten the amount of time spent on design between the ROD and the start of construction and hence accelerate project delivery, one of the key Metro program objectives. However, as Metro and Caltrans had already initiated the Project Approval and Environmental Document ("PA&ED") process, the P3 Advisory Team concluded that the negotiation of a PDA with a concessionaire at this stage would disrupt and delay the environmental process. Therefore, this delivery option was not evaluated further. However, given the multi-use concept for the corridor now being considered this conclusion warrants reconsideration in the Business Case phase of the HDMC.

This study concluded that the DBFOM option would provide an optimal delivery option, specifically because of its potential to minimize the requirement for public funds through private toll revenue-based financing and equity contributions. Project acceleration was also a key consideration in the selection of DBFOM as a preferred delivery option, as the HDC Project would be fully completed in FY 2020 compared to FY 2029 as envisaged in Metro's 2009 Long Range Transportation Plan ("LRTP").

The addition of rail service in the corridor, as well as energy development, would only reinforce this conclusion, both from the perspective of minimizing the requirement for public funds which is further enhanced by the additional uses of the corridor, and from the perspective of minimizing the schedule for delivering the project since DBFOM would maximize the synergy between the concurrent development of the range of uses. Therefore, it is clear that the optimal delivery strategy for the HDMC would also be a P3 DBFOM approach.

2.0 PROJECT DEFINITION

2.1. Project Scope

The High Desert region in northern Los Angeles and San Bernardino Counties has been one of the fastest growing areas in California. Several major studies have been carried out in recent years in order to define the transportation infrastructure improvements necessary to accommodate the increasing travel demand, both local and interregional.

The HDMC Project is envisioned to be developed as an integrated multimodal corridor for the High Desert area. The primary components of the corridor are a freeway/tollway between State Route 14 (SR-14) in Palmdale and Interstate 15 (I-15) in Victor Valley and a passenger rail service between Victorville and Palmdale. Palmdale in turn will be connected to Los Angeles either via the existing Metrolink Antelope Valley Line or the future connection to the proposed California High Speed Rail ("CaHSR") system.

Figure 2 presents the project location.

2.2. Passenger Rail Service

In February 2012, the HDC Project's environmental evaluation scope was expanded at the request of the High Desert Corridor Joint Powers Authority ("HDCJPA"). In addition to the current freeway/expressway or freeway/tollway elements and right-of-way ("ROW") reservation for future High Speed Rail, a "passenger rail service concept" was added between Palmdale and Victor Valley to form the HDMC. The EIR/EIS for the HDMC will include alternatives analyses, technical assessments, conceptual and preliminary engineering and cost estimates. This process is anticipated to result in identification of a locally preferred alternative in the third quarter of 2013 and a record of decision in the second quarter of 2014.[6]

Following are the project alternatives for the HDMC:

- Freeway/Expressway Alternative with High Speed Rail Feeder Service: This Alternative is the same as the HDC Freeway/Expressway Alternative (including Variations A, D, B and E) and includes a High Speed Rail ("HSR") Feeder Service between Palmdale and Victorville. The location of the HSR Feeder Service in relation to the HDC corridor is being evaluated considering design travel speeds, alignment of tracks and connections to existing rail stations. The incorporation of green energy technologies will also be considered.
- Freeway/Tollway Alternative with High Speed Rail Feeder Service: This Alternative is the same as the HDC freeway/tollway Alternative (including Variations A, D, B and E) and includes a HSR Feeder Service between Palmdale and Victorville. The location of the HSR Feeder Service in relation to the HDC corridor is being evaluated considering design travel speeds, alignment of tracks and connections to existing rail stations. The incorporation of green energy technologies will also be considered.

[6] Public-Private Partnership Program – High Desert Corridor Project Draft Business Plan, InfraConsult, May 2012

Figure 2 – High Desert Multipurpose Corridor Project Location

- Hybrid Corridor Alternative: This Alternative would consist of a combination of the previously identified alternatives, whose elements (TSM/TDM, Freeway, Expressway, Tollway, HSR Feeder Service, Green Energy Technologies) would be pieced together to best fit the needs of each section of the corridor. The determination of which elements to use, and at which locations, would be based on the results of the traffic study, environmental studies and public input.

For the purpose of this P3 evaluation study, the second rail option (i.e. freeway/tollway Alternative with High Speed Rail Feeder Service) is being studied. The alignment of the rail tracks will either be along the freeway/tollway median or will align along the southern side of the corridor. Regardless of which option is ultimately selected, the rail corridor will be accommodated within the 300-foot ROW that Caltrans has already reserved for the HDC, and no additional takings will be required. The alignment will terminate on the west side at either the existing Metrolink station or the future High Speed Rail in Palmdale, and on the east side at the future XpressWest station off the I-15 in Victorville.

This passenger rail service for the HDMC could either be a high-speed rail connection or an extension of the Metrolink Antelope Valley line between Palmdale and Victorville. Furthermore, this passenger rail service will constitute the missing rail connection between Los Angeles and Las Vegas, linking the existing Metrolink Antelope Valley Line (or the future CAHSR connection between Los Angeles and Palmdale) to the proposed future XpressWest at Victorville. XpressWest (formerly known as the DesertXpress) is an exclusive dual-track high speed passenger train with operating speeds up to 150 mph, connecting Victorville to Las Vegas.

2.3. Freeway/Tollway

The freeway/tollway component of the HDMC Project (see **Figure 2**), also referred to as the HDC, is a new 50-mile 4 to 8 lane freeway that extends from SR-14 in Palmdale to I-15 in Victorville which could ultimately connect with SR-18 east of Apple Valley. This freeway segment is roughly divided into the following three subsections:

- West Segment, from SR-14 to 90th Street (9 miles): a freeway, with direct 2-lane connectors with SR-14, bi-directional 4-lanes between SR 14 and 10th Street, and bi-directional 3-lanes between 10th Street and 90th Street, with interchanges at 10th Street, 20th Street, 50th Street and 90th Street;
- Central Segment, from 90th Street to US 395 (32 miles): initially a bi-directional 2-lane tollway with a wide median able to accommodate the future expansion to bi-directional 3-lanes, and up to eight local interchanges in its ultimate configuration; and
- East Segment, from US 395 to I-15 (9 miles): a bi-directional 3 lane freeway, with local interchanges at US-395, Phantom West and Phantom East Roads and National Trails Highway, a freeway-to-freeway interchange at I-15, and a local interchange at Dale Evans Parkway[7].

To optimize the HDC Project phasing, construction of the West and East Segments would take priority under either public or P3 delivery, as these segments, unlike the Central segment, each have independent utility for local traffic and are essential to connect the HDC at both ends to SR-14, US 395 and I-15. Due to their urban setting, however, the cost of constructing these

[7] An additional 13 mile expressway segment east of the I-15 ("Apple Valley Bypass"), connecting to SR-18 east of Apple Valley, is also included in the EIR/S but is not considered in the present PPP evaluation. It could be added when additional public funding becomes available.

segments is high relative to the potential revenues each could generate; therefore, no tolling has been considered at this stage for these two segments, nor for the Apple Valley ByPass. This is consistent to the assumptions of the *High Desert Corridor Project Draft Business Plan, InfaConsult LLC, May 2012*.

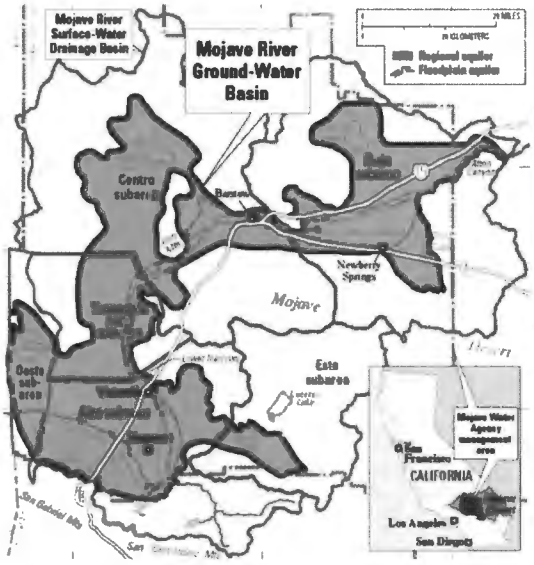
2.4. Other Corridor Uses

In addition to passenger transportation alternatives for the corridor, this study also explored the possibilities for other types of corridor uses. Of these possibilities that appear worthwhile but that did not warrant detailed analysis at this level of study is the development of an auto oriented rest area/plaza approximately midpoint in the corridor as well as selling billboard advertising rights. The various types of corridor uses considered for this evaluation are discussed in detail in the following sections.

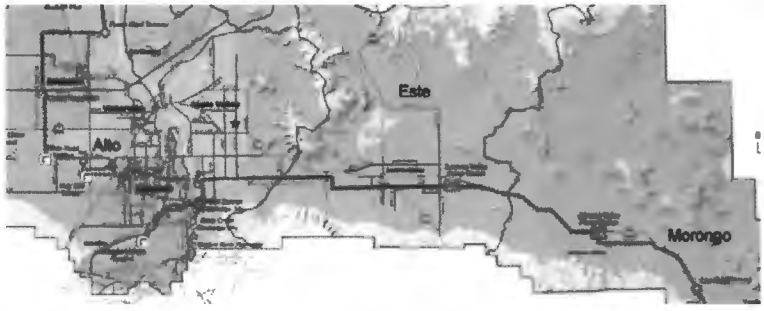
2.4.1. Water Usage

Utilizing the corridor's ROW for water transport from the Mojave groundwater basin and aquifer to the Metropolitan Water District of Southern California ("MWD") was a possibility that was explored as part of utilizing this corridor for multiple uses. The Mojave basin and aquifer, shown in **Figure 3**, is located within the project vicinity and is in the western part of the Mojave Desert, encompassing 1,400 square miles. Located about 80 miles northeast of Los Angeles, the area is subdivided into six management subareas. The Alto subarea falls within the study area and the Mojave River Pipeline intersects the HDMC alignment at 90 degrees, and ultimately connects to the California Aqueduct.

Figure 3 – Mohave River Basin, Aquifer and Pipeline



Location of Mojave River Groundwater Basin and Aquifer
Source: http://pubs.usgs.gov/fs/fs-122-01/pdf/fs-122-01.pdf



Location of Mojave River and Morongo Basin Pipelines Aquifer
Source: http://www.mojavewater.org/files/facilities34X4420070716.pdf

Figure 4 – Southern California Aqueducts

The MWD is predominantly served by three aqueducts – California, Los Angeles and Colorado, as shown in **Figure 4**. Despite the close proximity of California Aqueduct, and having the Mojave River Pipeline in place, a conversation with the Water Resource Management Group of the MWD made it apparent that the corridor could not effectively be utilized for water transportation. According to the MWD, the current capacity of the aqueducts is sufficient to meet water demands of Southern California. The agency has future plans for increasing the capacity of the California Aqueduct by raising the side walls, however those plans are not likely to come to fruition earlier than the next 15 to 20 years.

2.4.2. Energy Usage

This report also provides financial analysis, energy consumption estimations, and recommendations for implementation of this corridor as a "net-zero" energy corridor. A "net-zero" energy corridor refers to the offsetting of energy consumption by the generation of energy along the HDMC. The energy needs for a proposed rail line operating at a speed of 150 miles per hour ("mph") are approximately 500,000 kilowatt hours ("kWh") per mile per year or 25 million kWh for the 50-mile corridor. This is based off an assumption of the corridor providing for 13,000 trains carrying a total passenger load of 7 million per year (equating to 38 kWh per mile, per train).

According to Caltrans and LADWP, highways within the City of Los Angeles consumed over 25 million kWh of power in 2011 costing almost $3 ½ million. In the city, 181 miles of freeway exist, translating to an average of 140,000 kWh of energy usage per highway mile, per year. The cost per mile translates to $19,100 per year.

The estimated power consumption for a rural highway mile, per year, is significantly less because of the lower number of interchanges and limited power needs for illumination. This evaluation estimates that 27 million kWh would supply sufficient energy for both trains and other energy needs on the corridor. However, the calculations provide for an additional 10% for other

potential energy needs such as charging stations for electric vehicles, as well as 10% for excess line degradation.

Wind Energy

For this study the following two wind energy options were explored:

- According to Muni-Fed Energy[8], installing their UGE 9M (a 10kW vertical-axis wind turbine) every 100 feet on both sides of the freeway, 1,040 kW per mile which annually could generate 1.5 to 2.7 million kWh per mile per year depending on average wind speeds of 5.5 to 7.0 meters/second (m/s). The energy sold to a utility at $0.10 per kwh would generate up to $270,000 per year, per mile, while the initial investment would cost $5.4 million per mile. If installed the entire 50 mile length of the corridor, the total in initial investment would exceed $250 million. In this case, the initial capital cost would have to be lower or be subsidized to provide energy from wind to a rail line at a competitive price.

- Forecasts based on Wind Stream's Turbomill[9] technology, determined that an average wind speed of 6 m/s would generate approximately 1 million kWh of energy per mile, with an initial investment of $3.2 million. The same conclusion would apply.

Solar Energy

National Renewable Energy Laboratory's System Advisor Model ("SAM") was used to calculate the financial and energy production models for a high concentrated photovoltaic array located along the eastern half of the 50 mile HDMC corridor. The system life span is estimated at 30 years, while upgrades to the system after 30 years can extend the life of the project. Using SAM, approximately 33 million kWh of energy could be produced per year, while the cost is estimated at below $0.09 per kWh. The total price tag for the capital cost of the project including direct, indirect, and financing costs is estimated at $88 million.

The revenue generation was projected using the lowest likely amount of energy production expected from generation. **Table 5** provides a breakdown of the costs, income potential if excess energy was sold to a utility, and energy production.

Table 5 – Cost and Income from Solar Energy Production over 30 years (in Million $)

Total Cost	Total Gross Income	Total Net Income
$88.4	$123.6	$35.2

Total kWh	Average kWh per year	Average Cost per kWh
1,073,000,000	35,800,000	$0.08236

In consideration of the use of 100-foot ROW along the length of the HDC, a solar development company called Sun Power Corporation[10], confirmed that a solar array system could be developed using this type of land arrangement. Several factors affect the price of the project,

[8] http://munifedenergy.com
[9] http://www.windstream-inc.com/
[10] Information based off of phone interview conducted with Sy Kim of Sun Power Corporation

however, with the proper planning, a functional system at a similar price tag as the one represented above can be generated.

According to the Sun Power Corporation, the east-west length and the north-south width of the ROW provide optimal tracking of sunlight along the corridor, making it attractive for solar developers. Moderate concerns exist over the width of the ROW because a smaller number of trackers would be able to be installed. As a result, they could be installed in a side-by-side formation, as opposed to a block formation in which several trackers exist surrounding one inverter, increasing the efficiency of the conversion of photovoltaic power (DC) to AC power that can then be distributed for the powering of the rail line or for highway energy consumption. Due to the width, either more inverters would be needed to convert the electricity, or increases in wiring lengths would be needed to reach the inverters placed along the line. The pricing of this wiring depends on unpredictable commodity prices of materials like copper and aluminum.

Depending on the number of interconnection points to power the rail system, costs could be dramatically affected. For example, if two interconnection points existed along the entire rail line, the solar developer would need to extend wiring out to these two locations throughout the entire length of the corridor. The result of this would be a substantial increase in price. If the rail system had segmented interconnections at one-mile intervals, the cost for the solar array to power the rail system would remain very close to the numbers displayed above. In this, and the scenario above, a transmission line would not be necessary. It should also be noted that fencing and security costs in order to maintain the system would need to be calculated.

A traditional solar project of this magnitude would require between 73-146 acres of land to meet the targeted capacity. According to Sun Power Corporation, approximately 100 acres of land is needed to produce the average kWh per year numbers cited above. This amount of land could be deployed for solar generation in many different ways along the 50 mile corridor and further study would be required to identify the optimal configuration and location.

Compressed Natural Gas (CNG) Refueling Stations

Compressed Natural Gas ("CNG") refueling stations over the last 15 years have slowly increased in numbers but remain largely hidden from the public eye. The technology itself is not new, and the gasoline gallon equivalents ("GGE") in natural gas have yet to siphon off much from conventional gasoline markets. More recently, private fleets (taxis, transit agencies, refuse trucks, and delivery trucks) have expanded their use of CNG, however their refueling stations remain private, thus impeding the ability for everyday citizens to refuel their natural gas vehicles ("NGV"). Currently, there are 992 natural gas refueling stations in the United States.[11]

CNG maintains strong political support in Washington, D.C., creating federal grant opportunities for Metro, while adding financial support to the HDMC. Additionally, NGV sales are expected to increase at annual growth rate of 7.9 percent to total 19.9 million vehicles by 2016, according to Pike Research[12].

Currently, several companies are working to increase the numbers of CNG refueling stations. If Metro sold the rights of the refueling infrastructure along the HDMC to a company, this could be a viable source of revenue.. Due to the excess of natural gas in the United States, the low cost of

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[11] Smith, Rebecca. (2012, May 23) "Natural Gas Fueling Stations: Few and Far Between." The Wall Street Journal, retrieved 23 May 23 2012 from http://online.wsj.com/article/SB10001424052702304707604577422252404819664.html

[12] http://www.pikeresearch.com/blog/aga%e2%80%99s-mccurdy-on-the-future-of-ngvs

natural gas, and the uncertainty surrounding oil prices, Metro could take advantage of companies looking to expand their visibility and market share, with limited financial risk.

Transmission Line Infrastructure

Two options exist in which Metro could generate revenue through the construction of a transmission line from Palmdale to Victorville:

- Option A is a "generation line," where a transmission line from Palmdale to Victorville would connect to the Los Angeles Department of Water and Power ("LADWP") interconnection point in Victorville. The west end, in Palmdale, would not be connected to a utility line, making the transmission line a one-way line sending energy to LADWP. In this model, a transmission line developer could reach out to wind and solar companies and hold an auction to determine the costs renewable companies would pay for transmission.[13]

  After the completion of the auction, the utility could purchase the prospective power from the renewable energy company. This is commonly referred to as a power purchase agreement ("PPA"). Within the PPA, the cost of transmission would be incorporated. Through this fee, initial investment costs from the transmission line and payment for the land usage could be recuperated by Metro. Specifically, Metro could receive payments from the transmission line developer for the usage of the property. Maintenance would be managed through the transmission line developer or a subcontracted agent at no cost to Metro. Furthermore, contractual language agreed upon in advance could ensure Metro receives a payout for their investment before other entities involved in the project.

  However, unknowns exist until it is clear what the price renewable companies are willing to pay for transmission line fees, what the material cost of wind and solar are at the time of construction, and the market cost of wind and solar energy to a purchasing entity.

  In addition, transmission facilities located on the corridor have the possibility of contributing to the financial feasibility of the project as a whole by providing the infrastructure for numerous solar companies to locate their facilities along the HDMC and selling their power to a local utility. However, as a standalone project, the financial contribution would be relatively small in the total scheme of the project, and for purposes of this analysis it has not been assumed to be a contributor.

- Option B is similar to that of the Tehachapi Transmission Line project in which a line was built connecting to two Southern California Edison ("SCE") interconnection points, transmitting wind energy into the SCE grid (parts of this project are still in progress). This type of project is known as a "loop line." The California Independent System Operator ("CAISO") and a publicly owned utility would regulate the loop line. For this model, LADWP would not qualify because it is a municipal utility and not a public utility regulated by CAISO. If CAISO determined that the proposed loop line strengthens the grid and considers it a "regulated asset," it would direct the public utility (in this case, SCE) to both develop the line and cover the costs.

Summary of Energy Options

In summary, it is the conclusion of this study that the pursuit of a solar array system along the HDC with or without the use of transmission line infrastructure is potentially cost effective based on the

[13] Trans-Elect indicated the willingness to conduct an auction to raise capital for the project once a P3 agreement was signed, awarding Trans-Elect the transmission line project.

current level of analysis. This could be accomplished by constructing a solar array system along the length of the HDC, or more traditionally with a plot of land used for a photovoltaic array. It appears, based on available data, that the development of such a system has the potential to fully power the high-speed rail trains in the corridor as well as provide all other power needs for the corridor such as the standard level of rural highway illumination. Further, it is estimated it can be done at a lower cost than purchasing the power through existing sources, thus not only achieving a "net zero" energy consumption rate and concomitant minimal carbon footprint, but enhance the cost effectiveness of the integrated project.

2.5. Preliminary Design, Environmental Impact and Process

Project Approval and Environmental Document preparation studies ("PA&ED") were initiated at both ends of the Project for its freeway component in 2007 (Refer to **Figure 2**):[14]

- West Segment SR-14 to 100th Street (10 miles): Caltrans District 7 initiated Technical Studies for this segment under the original HDC Project Study Report (Project Development Study) ("PSR/PDS)". A Value Analysis Report and geometry for two alternative alignments from SR-14 to 100th Street and Structures Advanced Planning Studies ("APS") for the HDC/SR-14 interchange direct connectors were completed in the spring of 2010. The draft Traffic Analysis Report including preliminary traffic volume forecasts for 2035 was prepared by Parsons Transportation Group for the HDC mainline from SR-14 to US-395 in March 2010. The Caltrans Project Report was in progress and was expected by July 2010 (limited to SR-14 to 50th Street due to funding limitations) until a decision was made by the HDCJPA, Caltrans and Metro on May 12, 2010 to expand the scope of the PA&ED to the whole HDC project from SR-14 to I-15 (50 miles) and its connection to SR-18 east of Apple Valley (see below).
- Central Segment 100th Street to US-395 (31 miles): Caltrans District 7 initiated mapping and biological surveys in the spring of 2010.
- East Segment US-395 to I-15 (9 miles): The City of Victorville received federal funds to develop a portion of the HDC from US-395 to I-15 including a major interchange with I-15 and a 13-mile connection to SR-18 east of Apple Valley as a standalone "Phase 1 of the HDC." Preliminary engineering and environmental studies (EIR/S) were well underway by the beginning of 2010: geometry design, APS, project cost estimates, biological surveys and the traffic analysis report had been completed. Due to the decision to combine the PA&ED scope for the entire HDC, the studies completed by the City of Victorville were incorporated in the combined HDC Project.

Following the May 12, 2010 decision, a new PA&ED Scope of Work and a Partnership Agreement were negotiated between the HDCJPA, Metro, San Bernardino Association of Governments ("SANBAG"), and Caltrans Districts 7 and 8, in order to combine all studies undertaken, include both freeway/expressway and freeway/tollway alternatives and consider ROW reservation for a future High Speed Rail between Palmdale and Victorville, with the objective of completing the environmental document and obtaining project approval by the end of 2012.

As of June 2012, technical studies for the highway elements of the HDMC Project are substantially complete. However, with the recent addition of the high-speed rail and energy alternatives to the HDMC Project, the EIR/S will now include alternatives analyses, technical assessments, conceptual and preliminary engineering and cost estimates for three different uses

[14] Public-Private Partnership Program – High Desert Corridor Project Draft Business Plan, InfraConsult, June 2012

(highway, energy corridor and high speed rail connector service). For the rail service component between Palmdale and Victorville, the environmental evaluation will consider a high speed rail connection between the proposed XpressWest in Victorville and the existing Metrolink service and/or the future CAHSR in Palmdale. This process is anticipated to result in identification of a locally preferred alternative in the third quarter of 2013 and a ROD in the second quarter of 2014.

2.6. Concepts of Operations

2.6.1. Rail Service Operations

This passenger rail service for the HDMC could either be a high-speed rail connection or an extension of the Metrolink Antelope Valley line between Palmdale and Victorville, however for the purposes of this analysis, a high-speed rail connection was assumed as it is clear that would give the maximum financial benefit to the corridor. This passenger rail service will constitute the missing rail connection between Los Angeles and Las Vegas, linking the rail corridor between Los Angeles and Palmdale, served by the existing Metrolink Antelope Valley Line, and the future CAHSR connection between Los Angeles and the Central Valley, to the future XpressWest corridor beginning in Victorville. The XpressWest is an exclusive dual-track high speed passenger train with operating speeds up to 150 mph, connecting Victorville to Las Vegas.

For the purpose of this study, alternatives for train service include a one-seat and a two-seat option. The one-seat service would include high-speed rail connectivity between Los Angeles Union Station and Las Vegas, with intermediate stops in Palmdale and Victorville (and including possible stops at Burbank and Santa Clarita for some trips) as the Base Case for the evaluation of the HDMC project. The scope of the HDMC Project includes only the final design, ROW acquisition and construction of a new high speed Palmdale-Victorville rail connection with a 150 mph operating speed. This rail is anticipated to have connection to the existing or proposed rail stations in Palmdale and Victorville. It also includes the operation and maintenance of trainsets (Electrical Multiple Units ("EMU")) between Los Angeles Union Station, Palmdale, and Victorville as part of a one-seat rail service between Los Angeles and Las Vegas, as well as procurement of additional trainsets and systems necessary for this service.

Due to uncertainty on the timing of improvements to the Los Angeles-Palmdale rail line and/or construction of the CaHSR, a two-seat ride service was also evaluated as part of this study. This service includes a transfer at Palmdale combining a high-speed train service between Palmdale, Victorville and Las Vegas with either high-speed rail service as contemplated in the California High Speed Rail Authority Business Plan (referred to herein as the "enhanced two-seat ride") or an improved Metrolink service between Los Angeles and Palmdale. This improved Metrolink service would enable travelers to reach Palmdale within approximately an hour of departing from Los Angeles and vice versa.

2.6.2. Tolling Operations

Subject to sufficient public funding being available to fund the East and West connections, the Central Segment would be built, operated and maintained under a toll concession.

The toll applied to trucks could be a multiple of the toll applied to cars, based on number of axles as currently practiced on California toll roads and bridges. Heavy trucks would be required to be equipped with Fastrak transponders specific to their vehicle category. Axle and Height detectors would be installed to identify the vehicle category. Metro's Congestion Reduction Demonstration Program ("ExpressLanes") currently under construction on the I-110 and I-10 HOV

Lanes (conversion to two High Occupancy Toll ("HOT") lanes in each direction by mid-2013) will provide valuable information on users demand and willingness to pay for faster travel in the region.

Enforcement for toll collection will be effected through the "pay by plate" video detection system (combined with the axle and height detectors for categories other than passenger cars). Whenever no transponder is detected on a vehicle and the user has not paid the "pay-by-plate" toll (by phone or online) within a certain time period, a violation notice will be sent to the owner, adding the violation processing fee to the toll amount due. Each violation notice sent to the owner of the vehicle will include an offer to open an account and acquire a transponder. If no payment is received within 30 days, additional penalties apply, and past due amounts will be sent to collection.

3.0 COST ASSESSMENT

3.1. Capital Costs

Capital costs for the highway component of the project have been estimated based on Caltrans data assuming a single design-build construction contract for the three segments, totaling slightly more than $2.2 billion in current dollars. Rail costs utilized were approximately $1.6 billion for the Palmdale to Victorville segment and just under $700 million for the Palmdale to Los Angeles segment (in current dollars)[15]. Capital costs for the solar energy component (approximately $90 million) were based on available industry sources as discussed in the energy section of this report. These estimates are summarized in **Table 6** and are as follows (in 2011-12$ and YOE):

Table 6 – Capital Costs Summary (Millions, 2011-12$)

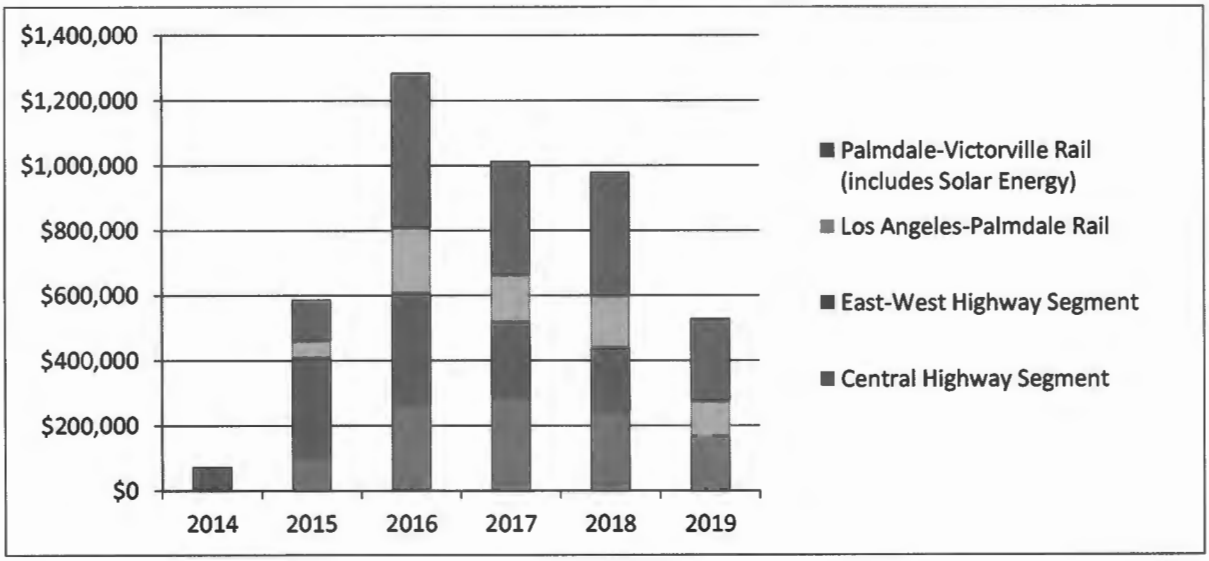
Item	Description	Total
1	West Highway Segment	600
2	East Highway Segment	560
3	Central Highway Segment	1074
4	Palmdale-VV Rail Civil Works	1060
5	Palmdale-VV Additional Train Sets	260
6	Palmdale-VV Rail Systems/Control	280
7	Palmdale-VV Solar Plant	90
8	Palmdale-LA Civil Works	*
8	Palmdale-LA Additional Train Sets	330
10	Palmdale-LA Rail Systems/Control	350
	Total Costs (current $)	**4,604**
	Total Costs (YOE $)	**5,878**

*Note: Cost for track improvements between Palmdale and Los Angeles are planned to be accomplished as part of the California High Speed Rail system. Cost for this is not included in this analysis.

Figure 5 below presents the cash flow profile for the capital expenditure for the Project from ROD (mid-2014) to completion of construction (end 2019).

[15] Capital cost estimates for the rail component drew from the California High Speed Rail and other relevant rail cost estimates that were available.

Figure 5 – Cost Profile of the Best Estimate (2011 $)



Note: Cost for track improvements between Palmdale and Los Angeles are planned to be accomplished as part of the California High Speed Rail system. Costs for this is not included in this analysis.

3.2. Operations and Maintenance Costs

3.2.1. Rail Operations

Operations and Maintenance ("O&M") costs estimates for the rail service between Los Angeles, Palmdale, and Victorville were estimated for each segment (Los Angeles to Palmdale and Palmdale to Victorville) in 2025, based on unit costs for train operations, infrastructure maintenance, stations maintenance, insurance and administration. They were obtained from existing and projected High Speed Rail operations adjusted for consistency with California data, summarized in **Table 7**.

Table 7 – 2025 Annual O&M Costs for Palmdale-Victorville & Los Angeles-Palmdale (2012 $'000)

	Unit	Cost/Unit	Palmdale to Victorville	Los Angeles to Palmdale	Total Los Angeles to Victorville
Route Length	Miles		55	63	118
Train Operations (2)	Train-miles	**$0.025**	$23,800	$27,200	$51,000
Maintenance of Infrastructure	Route-miles	**$250**	$13,700	$15,800	$29,500
Cleaning of Stations and Trains	# of Stations	**$5,100**	$5,100	$5,100	$10,200
Insurance	Route-miles	**$62**	$3,400	$3,400	$6,800
Administration	% of Costs	**10%**	$4,600	$5,100	$9,700
Contingency	% of Costs	**10%**	$5,100	$5,700	$10,800
Total			**$55,700**	**$62,300**	**$118,000**

Preventive maintenance and replacement costs for train sets and infrastructure are included in the above costs.

In turn, those costs were extrapolated for the 45-year operating period 2020-2064 assuming 30% of O&M costs vary with ridership forecasts (mainly train operating costs proportional to number of train-miles) and inflation, and 70% vary only with inflation.

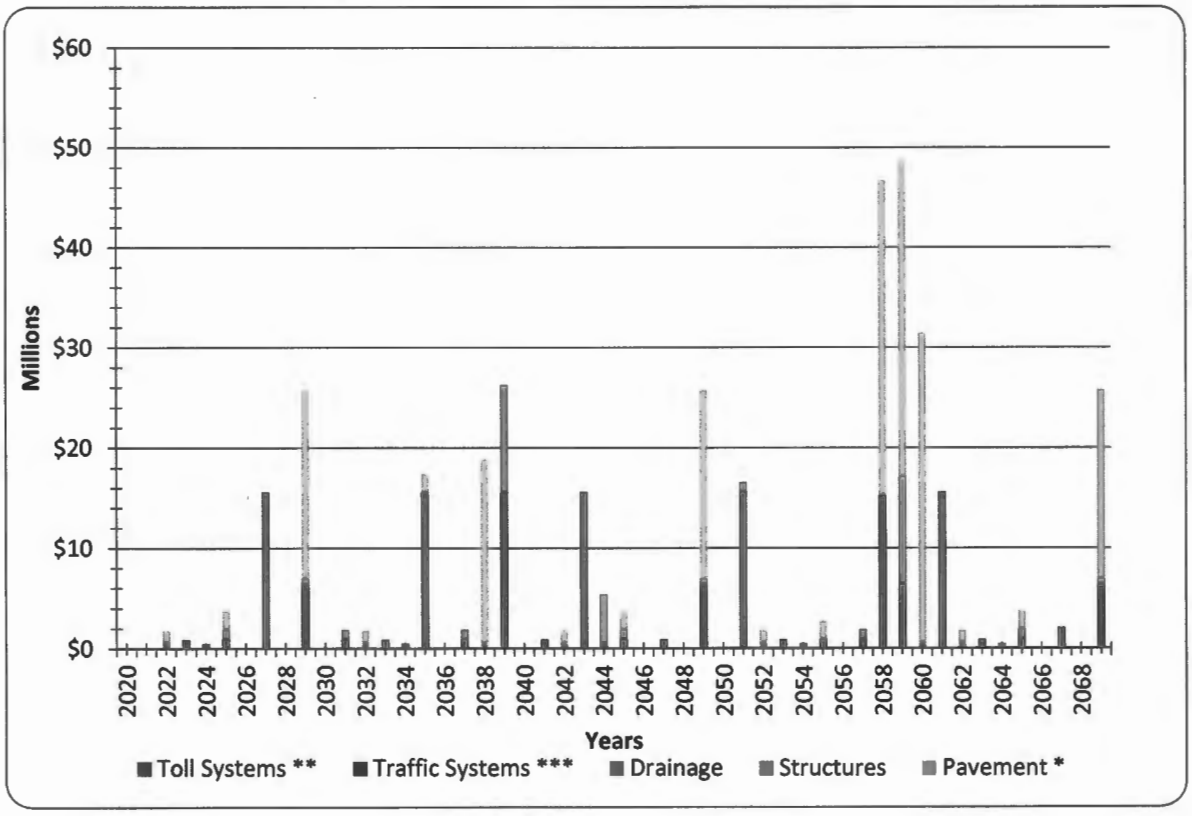
3.2.2. *Freeway/Tollway Operations*

O&M costs estimates for the freeway/tollway element of the HDMC corridor are the same as for the HDC Freeway/Tollway Alternative: costs were estimated for the tolled Central Segment only under a P3 delivery, as the East and West Segments are assumed to be turned over to Caltrans at the completion of construction.

Routine O&M costs for the Central Segment are anticipated to be approximately $10.6 million per year (2011 dollars), escalating at a rate of 3.0% (reflective of CPI and long-term growth in traffic volumes). Due to the anticipated opening of the East and West Segments one year ahead of the Central Segment, and assumed pent-up demand for the new connection between the Antelope and Victor Valley opening in 2020, full ramp-up is projected to occur in the third year of operations (2022).

The annualized lifecycle costs (preventive maintenance, replacement, plus major rehabilitation costs) average $6.9 million (2011 dollars) per year, or approximately $340 million over a 45-year operating period (2020-2064 after a 5-year construction period). **Figure 6** below shows the schedule and cost associated with the major rehabilitation of the HDMC Project components, with a spike for major pavement rehabilitation work spread over three years (2058-2060).

Figure 6 – Schedule of Lifecycle Costs (2011$)



3.3. Public Funding

3.3.1. Rail

Apart from San Bernardino Associated Governments' ("SANBAG") commitment of $500K to the environmental work to include the rail component, no other public funding has been programmed for the rail component of the HDMC. To be eligible for public funds in the future, the project would need to be added to the Regional Transportation Plan ("RTP") by the Southern California Association of Governments ("SCAG"), to which both Los Angeles and San Bernardino Counties are members.

The RTP is a 20-year fiscally-constrained blueprint for meeting mobility needs and air quality requirements within the region based on household and employment growth forecasts. The RTP is updated every four years (most recently in 2012), and only programs and projects outlined in the adopted RTP are eligible for State and federal funding. New projects can be proposed for inclusion in the RTP by local cities, agencies, and county transportation commissions, and forwarded to SCAG for review.

For available funding to be programmed, the Project would then need to be included in the Regional Transportation Improvement Plan ("RTIP"). The RTIP is a listing of all capital transportation projects proposed over a six-year period for the SCAG region. In the SCAG region, updates are made to the RTIP every two years, during even-numbered years. SCAG develops the RTIP based on consistency with the RTP.

3.3.2. Highway

For the capital costs of the highway component of the project, Metro has programmed a total of $33.0 million YOE through the Measure R program for environmental and design work to be undertaken through FY 2013. Federal earmarks secured over the prior decade in the amount of $16.75 million have also been obligated to other Project partners, including San Bernardino County, the Town of Apple Valley, and the HDCJPA. These funds are available for all phases of the project, with some restrictions imposed on their use for the design and study of HDMC Project segments within specified geographical limits.

The combined total of Measure R and federal earmarks represent approximately $50.0 million in programmed and available funding. This amount is expected to be adequate to complete the preliminary design and the environmental documents.

Capital funding necessary for the final design and construction of the HDMC Project has not yet been programmed by Metro or the Partner Agencies. Metro has identified $3,031.0 million in "highway strategy" revenues that would come from other future potential sources, including tolls/public-private partnership investment, state programs, and various federal formulas, earmarks, and grant programs.

Similarly, San Bernardino County's Measure I Strategic Plan identifies $213.0 million in anticipated funding for highway projects within the Victor Valley subarea through its Major Local Highways ("MLH") Program. Of this amount, SANBAG (San Bernadino Associataed Governments) staff estimates that $16.0 to $27.7 million may be available for the portions of High Desert Corridor located in San Bernardino County over the life of Measure I (2010-2040).

Released in January 2012, SANBAG's 10-Year Delivery Plan for Measure I Projects covering the period from FY 2010 through FY 2020 does not allocate any MLH funds to the High Desert

Corridor. Hence, any revenues from Measure I for the Project are not anticipated to be available until after FY 2020. The timing of these funds thus creates a mismatch with the proposed implementation schedule outlined in **Section 3.4**.

The sources and levels of programmed and/or anticipated funding for the HDMC Project are summarized in **Table 8** and **Table 9**.

Table 8 – Summary of Public Funding Sources

Source	Funding Level ($ Million)
Local	
Measure R	33.0
Measure I	16.0 - 27.7
Federal	
Earmarks (TEA-21, SAFETEA-LU)	16.8
TOTAL	**65.8 - 77.5**

Source: LACMTA Financing Forecasting Model, November 10, 2011; SANBAG Measure I Strategic Plan Part I, April 2009; Conversation with SANBAG staff, July 2010

Table 9 – Annual Levels of Programmed Funding ($ Million)

Source	Total	Prior	FY 2010	FY 2011	FY 2012	FY 2013	...	FY 2021-2040
Local								
Measure R	33.0		0.3	12.5	11.5	8.8		
Measure I	16.0 - 27.7							16.0 - 27.7
Federal Earmarks	16.8	16.8						
TOTAL	65.8 - 77.5							

The assumption in the HDC Interim Business Plan is that the HDC Project would be constructed beginning in 2015 with completion by the end of 2019 (FY 2020) and toll revenue operations would be anticipated to begin in 2020.

Public funds would need to be made available starting in FY 2015 after the publication of the ROD through FY 2019 for milestone payments and to initiate final design, acquisition of right-of-way, and other pre-construction activities for the East and West Segments.

The public contribution for the Central Segment, if any (or a potential reimbursement of public funding by the toll concessionaire in a high toll revenue scenario), would only start after completion of the full project and opening of the connection between SR-14 and I-15, necessary to provide adequate access (see **Section 4.3.3** Interim Analysis for an estimate of a High Subsidy and Low Subsidy range).

3.4. Implementation Schedule

Caltrans' previous PA&ED schedule for the HDC was recently revised due to the addition of "rail passenger service between Palmdale and Victorville" to the environmental studies. It added nine months to the circulation of the draft EIR/EIS and one year to the PA/ED final approval and signature of the ROD, and is summarized as follows:

Milestone/Items/Action	Project Dates
Begin Work	08/2010
Initiate Public Scoping	10/2010
Prepare Draft Technical Studies	08/2010 – 06/2013
Draft EIR/EIS Circulation	Summer 2013
Public Hearings	10/2013
Respond to Comments/Complete Final EIR/EIS	12/2013 – 03/2014
Caltrans signs Final EIR/EIS	04/2014
Caltrans Signs ROD and files NOD	06/2014

The schedule for implementation of the HDMC Project assuming the circulation of the draft EIR/EIS in the summer of 2014 is presented in **Table 10** for the P3 delivery compared with a traditional DBB procurement.

Table 10 – Key Milestone Dates

Activity	P3 Combined DB/DBFOM Delivery	Traditional DBB Procurement
Draft EIR/EIS circulation	3rd Quarter 2013	3rd Quarter 2013
Complete Final EIR/EIS	1st Quarter 2014	1st Quarter 2014
Record of Decision	2nd Quarter 2014	2nd Quarter 2014
Issue Request for Proposal	4th Quarter 2013	2nd Quarter 2016
Commercial Close	4th Quarter 2014	3nd Quarter 2016
Contract Award	4th Quarter 2014	4th Quarter 2016
Construction Commencement	1st Quarter 2015	1st Quarter 2017
East & West Segments complete	4th Quarter 2017	4th Quarter 2020
Central Segment complete	4th Quarter 2019	4th Quarter 2023
Operations Commencement	1st Quarter 2020	1st Quarter 2025

For the purposes of this study, construction of the highway, rail and energy facilities are assumed to constructed concurrently to maximize construction efficiencies and minimize costs. The sequence of activities for the P3 delivery would be as follows:

- Final Design and ROW Acquisition: West and East Segments 2014 – 2016, and Central Segment 2014 – 2017, all subject to public funding being available.
- Construction of West and East Segments: 2015 – 2018 if funding is available, open to traffic in 2019.
- Construction of Central Segment (90th Street to US-395): 2016 - 2019, and connection between SR-14 and I-15 opening to traffic in 2020.

4.0 EVALUATION APPROACH

4.1. Approach for Evaluation of Feasibility

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. An expanded program of projects in the corridor dictates a reexamination of these goals and associated criteria. These goals are to:

- **Optimize risk transfer.** As the Project sponsor, Metro typically retains responsibility for all risks related to ROW acquisition, permitting, environmental clearance, and public acceptability. Under a P3 procurement, a concessionaire 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 concessionaire'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. The optimum delivery option dictates that Metro 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.
- **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 11**, evaluation criteria were developed to guide the assessment of each project option's potential to fulfill the goals of Metro's P3 Program.

Table 11 – Metro P3 Program Goals and Evaluation Criteria

Goals	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/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 to provide greater access to alternative sources of finance
	Metro control over toll policy 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

4.2. Ridership and Revenue Assessment

Ridership and revenue forecasting is a key element in evaluating the financial feasibility of any transit project. For this study a very high level schematic approach was taken to estimate annual revenue from the fare box, which is consistent with the overall objective of this study. The key assumptions for the ridership and revenue forecast rely heavily on a comprehensive study completed by URS Corporation in 2005. The URS Study was performed as part of the EIS for DesertXpress (now XpressWest). The assumptions obtained from the URS Study were augmented by information and data, both qualitatively and quantitatively, from the following three sources:

- DesertXpress Ridership Forecast Review prepared by Cambridge Systematics Inc. (2005)
- DesertXpress Ridership and Revenue Audit prepared by Steer Davies and Gleave (2007)
- Las Vegas to Los Angeles Rail Corridor Feasibility Study prepared by IBI Group (2007)

The three fundamental inputs that were derived from the above studies include the size of the travel market between Southern California and Las Vegas, the capture rate of XpressWest, and

the growth parameters. It is critical to note that this study did not perform any data collection or model development for this evaluation and inputs from existing studies by peers were taken as is.

4.2.1. Travel Market Size and Capture Rate

The first step in any ridership forecasting approach is to estimate the market size. URS estimated the size of total travel market between Southern California and Las Vegas at 15.8 million and 18.2 million in 2005 and 2012, respectively. The study performed by the IBI Group for the Regional Transportation Commission ("RTC") of Southern Nevada in 2007 estimated the market size at approximately 26 million in 2004.[16] It is to be noted that the scope of the IBI Group Study was much wider and the mode was a traditional train between Las Vegas and Southern California while the URS Study was catered exclusively for XpressWest. The URS Study only accounted for traffic from Southern California to Las Vegas while the IBI Study accounted for approximately 800,000 overnight trips between Los Angeles area and Clark County in 2003. Based on these studies, and using a reasonable growth factor, this evaluation study assumed a total market size of approximately 21Million in 2012. This market size is on par with various market research data available currently for travel markets between Southern California and Las Vegas for all current modes of travel (auto, bus and air). Although a wide variation in growth assumptions (in total travel market size) ranging from 1% to 4% was found in the available studies, in light of the recent economic downturn, this analysis assumed a year over year growth of 2% in total travel market until 2025, 1.5% between 2025 and 2040, and 1% beyond 2040.

In addition to the annual growth, this study assumed a 5% increase in total market in 2020 due to CaHSR. Although this study recognizes the phased implementation of CaHSR, at this level of this schematic analysis it was not necessary to overlay the CaHSR schedule and perform a detailed investigation to explicitly model the ridership contribution from CaHSR. The total market size based on the above studies and annual growth assumptions are presented in **Table 12**.

Table 12 – Total Travel Market (in millions) between Southern California and Las Vegas

2012	2020	2030	2040	2050
21.0	25.8	30.7	35.6	39.4

According to the URS Study, XpressWest is forecast to capture 22.8% to 24% of the Southern California market depending on whether the trains were Diesel Multiple Units ("DMU") or EMUs. Capture rates depend on fare, headway and other factors (e.g. stops, parking, etc.). This evaluation used this rate (22.8% to 24%) as the base capture rate by XpressWest. Cambridge Systematics and Steer Davies and Gleave ("SDG") have confirmed the overall reasonableness of URS estimates, albeit with some reservations. Furthermore, SDG has suggested several upside potentials including implementation of CaHSR and increase in fuel price. To the best of our knowledge, potential upside due to a direct connection to Los Angeles is not discussed in any of the reports.

Since the URS Study, a number of factors have influenced ridership. These include but are not limited to increase in fuel price, reduction in travel time between Victorville and Las Vegas from 100 minutes to 80 minutes, onboard experience, and loyalty programs. It is reasonable then to expect a corresponding increase in ridership and accordingly, this study assumed an additional

[16] Table 8-3: Estimated 2004 Person Trips between Clark County and Southern California, Las Vegas to Los Angeles Rail Corridor Feasibility Study, IBI Group, 2007

3% capture rate in response to these factors. In other words, our ridership forecasting for the HDMC Project is based on a 27% capture rate of the total market by XpressWest on the Victorville to Las Vegas segment (vs. 24% in the URS original forecast without the rail connection to Los Angeles). The number of riders for XpressWest is presented in **Table 13**.

Table 13 – Annual XpressWest Trips (in millions)

Year	2020	2030	2040	2050
Person-Trips	6.97	8.29	9.61	10.62

Table 12 and **Table 13** form the basis for developing the demand forecasts for the Los Angeles to Victorville rail corridor. The ridership forecasting for a one-seat ride between Los Angeles and Victorville was performed through the following steps:

- Based on the Advisory Team's engineering judgment and distances from various counties within the catchment area of XpressWest to Los Angeles Union Station, the analysis estimated the percentage of XpressWest riders that would be riding the trains either from Los Angeles Union station or Palmdale. It is worth reiterating that these factors need to be validated with detailed data and survey in the near future when the HDMC study progresses beyond its feasibility study. The factors are presented in **Table 14**. Hence, based on **Table 14**, 95% of the XpressWest riders from Los Angeles County will also take the train from Los Angles Union station to Victorville to continue on to Las Vegas. Similarly, Riverside and San Bernardino counties will not contribute to any ridership, as expected, for the Los Angeles to Victorville segm ent. Clearly, these factors reflect route/mode choice behavior of XpressWest riders and hence they should not be confused with the capture rate.

Table 14 – Percentage of XpressWest Riders to use HDMC Train Option

County	Clark	Santa Barbara	Ventura	Los Angeles	Orange	Riverside	San Bernardino	San Diego	Others
HDMC Factor	90%	99%	99%	95%	80%	0%	0%	15%	90%

- The analysis used the URS Study and county population data to disaggregate **Table 12** to obtain demand from various counties presented in **Table 14**. A capture rate of 27% was applied to estimate XpressWest ridership from each county. XpressWest ridership estimates from each county were adjusted by factors presented in **Table 14** to obtain the demand for the Los Angeles-Victorville segment. The total base rail ridership estimate for the Los Angeles to Victorville segment is 4.92 million, and is presented in **Table 15**.

Table 15 – 2020 HDMC Train Users by County (in '000s)

County	Clark	Santa Barbara	Ventura	Los Angeles	Orange	Riverside	San Bernardino	San Diego	Others	Total
Market	4,509	181	362	8,497	2,712	2,712	1,265	2,170	3,376	25,784
Ridership	1,102	48	97	2,180	586	0	0	88	820	4,921

Note: Los Angeles - Vegas is not estimated at this point. The analysis considers just XpressWest riders that would take HDMC between Los Angeles and Victorville

4.2.2. *One-Seat Ridership and Revenue Forecast*

It is evident that a seamless connection between Los Angeles and Las Vegas will result in an enhanced ridership both through a slight increase in capture rate beyond the base XpressWest ridership (i.e. without Los Angeles to Victorville connection) and in total market size. In addition, CaHSR is expected to have further positive impact on the ridership. While a detailed study including a preference survey is needed to quantify precisely the positive impact on train ridership between Los Angeles and Victorville due to CaHSR and the availability of an improved Los Angeles to Victorville connection, this study assumes a 12% increase in the ridership to reflect this positive impact. The adjusted annual person trips between Los Angeles and Victorville under one-seat Ride Scenario in 2020 (assuming CaHSR between Los Angeles and Palmdale) is 5.51 million. Ridership forecast for outer years (2020 through 2050) is presented in **Table 16**, and was obtained through linear interpolation. Finally, annual revenue is calculated based on a one-way fare, of $52.34 in 2020 and $51.20 in 2050 (both in 2010 dollars). Although the average round-trip fare is similar to that used for XpressWest, clearly, a more detailed study is needed to optimize the pricing.

Table 16 – HDMC Train Annual Ridership and Revenue under One-Seat Scenario (in millions)

Los Angeles - Victorville

Year	2020	2030	2040	2050
Person-Trips	5.51	6.56	7.60	8.40
Revenue (2010$ millions)	285	339	383	422

The study assumes that the three segments (Los Angeles to Palmdale, Palmdale to Victorville and Victorville to Las Vegas) of the Los Angeles to Las Vegas high-speed rail corridor will be implemented in phases. The one-seat ride analysis, described above, is obviously the ultimate configuration.

4.2.3. *Two-Seat Ridership and Revenue Forecast*

This study assessed the feasibility level revenue forecasting for the scenario where Palmdale to Victorville and Victorville to Las Vegas segments operate at high-speed (150 mph) while the Los Angeles to Palmdale segment operates as an improved Metrolink service. It is envisioned that the transition from current operation, i.e. at-grade Metrolink operation between Los Angeles and Palmdale to a high speed rail operation, will happen over time. At this level of feasibility analysis, it is not important to explicitly model the transition time and its impact on ridership and revenue. Therefore, the analysis assumed a simpler two-seat ride scenario where riders are expected to take Metrolink service to Palmdale and then transfer to direct high speed rail service to Las Vegas with a stop in Victorville.

Ridership forecasting for this scenario is more complicated than the previous one (i.e. the one-seat option) and requires a comprehensive survey to understand the mode choice of riders that are expected to switch from Metrolink to high speed train at Palmdale. Besides traditional Value of Time ("VOT") savings and the convenience of riding a train, the capture rate of high speed rail from Palmdale to Las Vegas will also heavily depend on a number of operational factors including ease of transfer, length of waiting time at Palmdale and Los Angeles Union Station, and Metrolink frequency. It is neither possible nor relevant to account for such operational details in ridership forecasting at the feasibility level. Furthermore, a rigorous VOT and mode choice analysis will require significant amount of survey data and model estimation. Being cognizant of these challenges, the following section presents a simpler approach based on

average distances and travel times adopted to develop a high level estimate of ridership for two-Seat Ride Scenario.

Total travel market, XpressWest ridership, and origins of XpressWest riders (**Tables 12, 13** and **15**, respectively) form the basis for two-seat ride forecasting. The first two steps for the two-seat ridership forecasting are similar to that used for the one-seat ride scenario with the assumption (based on the best practice judgment of the InfraConsult advisory team) that the two-seat ride is not a viable alternative for day trips. Previous studies have forecast that about 8-10% of the total trips are mid-day trips.

After defining the market, trips and origin-destination ("OD") patterns, the basic task was to develop an approach that provided a reasonable estimate of split between riders accessing XpressWest through HDMC vs. those accessing XpressWest by driving to Victorville. This study used the XpressWest forecast from the URS Study to determine the share of rail riders that are likely to access XpressWest through HDMC, i.e. through Los Angeles and/or Palmdale. It is apparent that this proportion will greatly depend on origins of XpressWest riders. For example, while almost all XpressWest riders from and to Los Angeles downtown will access XpressWest through HDMC, train users from San Bernardino and Riverside County will not contribute any ridership to Los Angeles-Palmdale corridor. Hence, a singular average number to represent this proportion (of drivers who use HDMC to access XpressWest) could yield a very misleading result. Therefore, the proportion of XpressWest riders accessing the system through HDMC was calculated separately for each origin (in the case of traffic originating in Southern California) and destination (in case of traffic originating in Las Vegas).

For an estimate of two-seat ridership, distances between various origin/destination cities and Los Angeles, Palmdale and Victorville were calculated. Based on average driving and Metrolink speeds of 45mph and 40mph respectively, travel times between origin/destinations and the three cities (Los Angeles, Palmdale and Victorville) were calculated. It is important to note that driving speeds vary significantly depending on time of day and day of week. Hence, the current forecasts, while sufficient for this level of feasibility analysis, should be interpreted with caution. Although Metrolink's speed easily exceeds 80mph on some sections of the Metrolink alignment, for the purpose of travel time calculation, a conservative estimate of 40mph was deemed reasonable to account for time lost due to station stops, acceleration/deceleration and the like, in order to obtain comparable travel times to Victorville by the way of HDMC and by direct driving.

A rudimentary approach would be to obtain the split across two paths to Victorville solely based on travel times, i.e. split the riders across two paths in the inverse proportion to travel times. However, reliability, comfort and desire to avoid driving arguably play just as important role in mode choice decision as is travel time savings, trip costs, particularly in light of trip type and train experience. Clearly, it is extremely difficult to quantify the impact of such behavioral preference without elaborate surveys, significant traffic data collection, analyses and model estimations. In the absence of such data, this study relied on professional judgment to translate above assumed behavioral preferences and derived five levels of travel time differences and corresponding level of diversion, i.e. proportion of drivers who will take HDMC. The result is presented in **Table 17**.

Table 17 – Proportion of Drivers Selecting HDMC as a Function of Travel Time Difference

Travel Time Difference	>0 minutes	0-20 minutes	20-30 minutes	30-40 minutes	More than 40 minutes
Proportion	90%	20%	15%	10%	5%

Table 18 should not be interpreted as capture rate or mode choice. It reflects the percentage of XpressWest riders that are assumed will take HDMC. The proportions from **Table 17** are applied to individual trip ends to obtain final ridership for two-seat ride. **Table 18** presents HDMC ridership for various years. Annual revenue, as in previous section, is calculated by multiplying the ridership with the fare as described above. Under the Two-Seat Ride Scenario, the fare utilized from Palmdale to Victorville was approximately $20.

Table 18 – HDMC Train Annual Ridership and Revenue under two-seat scenario (in millions) Palmdale to Victorville

Year	2020	2030	2040	2050
Person-Trips	2.91	3.39	3.87	4.30
Revenue (2011 $)	61	71	81	90

4.2.4. Enhanced Two-Seat Ridership and Revenue Forecast

The following three refinements were made to the base case scenario for two-seat ride to capture the enhanced ridership due to faster and more comfortable service between Los Angeles and Palmdale and between Anaheim and Los Angeles through CaHSR system:

- Assumed a high speed rail service between LAUS and Palmdale in 30 minutes. The base case two-seat scenario assumed a travel time of 65 minutes between the above two stations.
- Assumed a seamless connection at Palmdale resulting in a higher level of comfort and lesser amount of waiting time than those for the base case scenario. It was not possible to collect stated preference data and develop a choice model within a very short time frame. Therefore, it was simply assumed that 95% of the XpressWest drivers would go through Los Angeles Union station if the driving time from their origins to Victorville is less than equal to the travel times between their origins and Victorville through LAUS.
- Assumed that CaHSR between Anaheim and Los Angeles is expected to further enhance the ridership between Orange County and Las Vegas through LAUS and Palmdale. In the high level spreadsheet based schematic model, it was found that a large percentage of Orange County travelers to Las Vegas are expected to go through LAUS. Thus this connection will further increase the proportion of Orange County based XpressWest riders. While a detailed model is necessary to accurately capture this increase, this analysis assumed that 95% of the Orange County based XpressWest riders will ride CAHSR to Los Angeles and then continue on to Las Vegas.

The overall impact of the above three factors is an increase of 40-45% in the revenue (over base case two-seat ride scenario) between Palmdale and Victorville. The reduction in travel time between Los Angeles and Palmdale is responsible for approximately 30% increase i.e. about 75% of the total increase in revenue comes from a CAHSR connection between LAUS and Palmdale.

4.2.5. Highway Traffic and Toll Revenue Forecasts

Toll revenues for the highway facility are based on the "base case" T&R forecast developed by Parsons Transportation Group in the HDC Interim Business Plan. This analysis assumes no modification to "base case" toll revenues resulting from the addition of rail service along a coterminous route. The Parsons projections take into account the CaHSR service in Palmdale

and XpressWest service between Victorville and Las Vegas, but do not account for a train connection between Palmdale and Victorville.

Revenue estimates are based on tolls on the Central Segment of the HDC only, with rates of $0.15/mile for cars and $0.37/mile for heavy trucks (i.e. a total toll of $4.80 for cars and $12 for heavy trucks). Opening year gross toll revenues in FY 2020 are estimated at $55.1 million in 2011 dollars ($78.2 million YOE), and escalated at 3 percent annually over the concession period through FY 2064 for the following totals:

Given the lack of available and/or committed public funding, the delivery of the highway component of the HDMC Project relies heavily on the tolling of the Central Segment. Low and high toll revenue forecasts were developed for the HDC Central Segment based on traffic and revenue projections by Parsons.[17] The gross revenue total shown in Table 15 falls within the range of "low" and "high" toll revenue forecasts used for previous analysis of the construction subsidy range required to deliver the High Desert Corridor. The mid-range estimate was chosen to simplify the number of variables being considered in the financial analysis for the HDMC (see High Desert Corridor Business Plan, Appendix B) and to provide a clear indication of whether the inclusion of rail increases or reduces the funding gap associated with the highway facility.

For the HDMC Project, the existence of a direct high speed train connection between Palmdale and Las Vegas, particularly with the one-seat ride to and from Los Angeles, is likely to entice more Las Vegas travelers to switch to the train and thus reduce potential traffic and revenue on the HDC tollway segment. However, several factors could offset this potential reduction:

- The potentially positive effect of a multimodal corridor on the demographic and socio-economic development of the High Desert region;
- The accessibility and mobility benefits of the rail component and their effect on increasing the total number of trips in the corridor;
- The limited potential modal shift due to the relatively low toll level ($5 per vehicle) compared to the assumed train fare ($20 per passenger) between Palmdale and Victorville.

A more detailed analysis of the effect of these different factors on the modal split between highways and high speed rail will be developed by Caltrans and Metro in the next phase of the HDMC environmental studies. For the high level analysis of this feasibility study, the professional judgment of the Advisory Team is that the range of revenue forecasts developed for the HDC Freeway/Tollway Alternative can be used as the best estimates currently available.

These forecasts, summarized in **Table 19** for the entire operation period (2020-2064), are based on tolls on the Central Segment only, with toll rates of $0.15/mile for cars and $0.37/mile for heavy trucks (i.e. a total toll of $4.80 for cars and $12 for heavy trucks).

[17] High Desert Corridor Project Interim Business Plan, InfraConsult, June 2012. Appendix D

Table 19 – HDC Toll Revenue Forecast 2020-2064 (in millions $)

	2011$	YOE$
Toll Revenue (Low Forecast)		
Auto Toll Revenue	3,840	11,348
Truck Toll Revenue	933	2,757
Total Toll Revenue	**4,773**	**14,105**
Toll Revenue (Base Case Forecast)		
Auto Toll Revenue	4,068	11,663
Truck Toll Revenue	1,200	2,938
Total Toll Revenue	**5,268**	**14,601**
Toll Revenue (High Forecast)		
Auto Toll Revenue	4,393	13,077
Truck Toll Revenue	1,464	4,359
Total Toll Revenue	**5,857**	**17,436**

4.3. Financial Analysis

4.3.1. Methodology

The financial analysis evaluates whether the funding gap is reduced or increased if the High Desert Corridor were to be built as a multimodal corridor and financed, operated, and maintained as a P3.

To assess the net financial impact of adding passenger rail to the HDC project, four scenarios were analyzed:

- **Highway Only**. The 30-mile toll facility would be built, financed, operated, and maintained by a concessionaire as a standalone project without a rail corridor. This scenario acted as a benchmark against which to compare the subsidy requirements of other scenarios in which both highway and rail are combined into a multimodal corridor.
- **One Seat Ride**. The concessionaire would operate continuous one-seat ride service from Los Angeles Union Station to Victorville and retain all passenger rail revenues associated with the entirety of the route. The concessionaire would also operate the 30-mile tolled segment of the HDC highway facility between Palmdale and Victorville.
- **Two Seat Ride.** The concessionaire would operate service only between Palmdale and Victorville. Passengers originating their trips in the Los Angeles metropolitan region are assumed to access the Palmdale station either via auto or existing Metrolink service, which operates conventional rail service from Los Angeles Union Station. The concessionaire would also operate the 30-mile tolled segment of the HDC highway facility between Palmdale and Victorville.
- **Enhanced Two-Seat Ride**. The existing Metrolink corridor would be upgraded with improvements allowing for faster operation of rail service between Los Angeles and Palmdale, where passengers are assumed to have a convenient cross-platform transfer to Victorville-bound HSR trains. The enhanced two-seat ride would reduce travel times

and increase ridership. The concessionaire would also operate the 30-mile tolled segment of the HDC highway facility between Palmdale and Victorville.

At this early stage of Project development, the analysis focused on the implementation of the HDMC as a concession. If total private financing capacity supported by highway and rail revenues was found to be less than capital funding needs during construction, upfront public investment (a subsidy) was then assumed to fill the gap between private financing proceeds and capital funding needs during construction.

Forecasts for toll revenues, O&M costs, and periodic rehabilitation and replacement (R&R) costs were used to determine the forecast net cash flow available for debt service and potential return to equity, for each scenario. Adjusting for the potential capacity for private sources of financing from debt and equity, the total cost of project delivery to Metro was derived as:

- Funding provided during the construction period of the HDMC Project (treated in the financial model as an offset to total capital funding requirements covered by private financing); and
- Costs for activities outside of the scope of the P3 Project but still within the scope of Metro's HDMC Project for delivery (provided as a cost input). For example: monitoring by Caltrans and Metro during construction, pre-development costs before construction start and right of way acquisition. Metro-retained costs for pre-development, ROW, and construction supervision are estimated at $520 million YOE.

Each scenario was modeled based on the key components of a potential financial structure that may be proposed by consortia competing for the Project concession. For the highway-only scenario, it was necessary to adjust some of the inputs and assumptions used in the previous analysis of the HDC due to changes in market conditions and legislation that have occurred since the previous analysis was performed.

Notably, the passage of MAP-21 increased the share of eligible projects costs that may be financed by the Transportation Infrastructure Finance and Innovation Act ("TIFIA") program from 33% to 49%. USDOT has given strong indication that a 49% allocation of TIFIA will only be granted under exceptional circumstances to projects both in need of a high level of financial assistance and aligned with the TIFIA program objectives. For this analysis, it was assumed that a highway-only facility would not be competitive enough to receive TIFIA at 49%. Therefore, the highway-only scenario was modeled with the following financing structure:

- Senior debt tranche: in the form of a Private Activity Bonds (PABs);
- Subordinate debt tranche: in the form of a TIFIA loan, up to 33% of eligible project costs but not to exceed the amount of the PAB issuance;
- Private equity to be provided by a toll concessionaire, drawn during construction with dividends being paid during the Project life.

For the HDMC one and two-seat scenarios, the multimodal characteristic of the Project makes it a strong candidate for TIFIA at 49% and a Railroad Rehabilitation Infrastructure Financing ("RRIF") loan. The lower cost of financing associated with these two USDOT-sponsored programs is considered a key advantage in the addition of the rail service component to the HDC, as the combined use of TIFIA and RRIF would support the issuance of additional debt and investment of developer equity, thereby potentially reducing the public subsidy needed during construction. The following capital structure was hence used to calculate the capacity for private financing:

- Senior debt tranche: in the form of a TIFIA loan, up to 49% of eligible project costs;

- Subordinate debt tranche: in the form of a RRIF loan, up to 100% of eligible project costs associated with the rail component;
- Private equity to be provided by a toll concessionaire, drawn during construction with dividends being paid during the Project life.

Current market conditions informed specific assumptions used in the financial model about the ratio of debt to equity, return on equity, debt sources and debt service cost, and the length of the concession contract, outlined in **Table 20**. Detailed financial modeling was performed to assess the net project cost to Metro.

Table 20 – Financial Assumptions

	One-Seat Ride	Two-Seat Ride (Basic and Enhanced)
P3 approach	Toll and rail concession including transfer of risks associated with design, construction, operations, financing and maintenance.	Same as One-Seat Ride
P3 contract term	50 years from the start of construction	Same as One-Seat Ride
Analysis start date	2012 – includes predevelopment activities to be completed by Metro	Same as One-Seat Ride
Construction start date – end date	2015-2019	Same as One-Seat Ride
Operations start date – end date	2020-2064	Same as One-Seat Ride
Revenues	Highway: Tolls Rail: Fare revenues LAUS-VV	Highway: Tolls Rail: Fare revenues Palmdale to Victorville only
Timing	50-year concession	Same as One-Seat Ride
Financing structure	TIFIA loan, RRIF loan, and private equity	Same as One-Seat Ride
Target Gearing	70:30 (debt to equity)	80:20 (debt to equity)
Cost of financing	3.00% - TIFIA 3.00% - RRIF 14% - Private Equity IRR (pre-tax)	Same as One-Seat Ride

Up to 70% of the capital structure was assumed to be financed from debt and the remainder being private equity. The equity portion was assumed to require a pre-tax return of 14% (higher than a typical availability deal based on the additional risk in assuming revenue responsibility for repayment).

4.3.2. Cost Allocation Assumptions

Under both one-seat and two-seat ride scenarios, various capital and service improvements would need to be made to accommodate high-speed rail service between Los Angeles Union Station and Palmdale. The financial analysis makes the following assumptions regarding the allocation and sharing of costs:

- The inclusion of the rail corridor in the highway median or alongside the highway within the 300-feet HDC footprint between Palmdale and Victorville assumes no additional right-of-way costs for the Project; no provision has been made for land acquisition for the two end connections to the stations in Palmdale and Victorville;
- The costs associated with ROW and capital improvements along the existing Metrolink corridor, including but not limited to additional track, electrification, grade separations, and signal improvements, would be borne by the CaHSRA, Metrolink, and/or other regional agencies;

- The concessionaire's annual O&M costs include contributions toward shared station operations at Palmdale and shared track maintenance proportionate to its usage of these facilities;
- Beyond these annual O&M contributions, no track access fees would be charged to the concessionaire for use of the ROW between Los Angeles Union Station and Palmdale;
- For the one-seat Ride Scenario Metrolink would not be reimbursed for any loss of ridership but would accrue any operating cost savings anticipated to occur from passengers switching to higher-speed trains between LAUS and PD, for which Metrolink currently offers commuter rail service; and
- For the two seat ride scenario, Metrolink would assume additional operating costs and receive the additional revenue associated with increasing the frequency of service required to minimize scheduled transfer times at Palmdale Station between Metrolink and high-speed rail service to Victorville.

4.3.3. Results

As shown in **Table 21** below, if the HDMC Project were to be built as a multimodal corridor, the private financing capacity generated in the "one-seat" scenario eliminates the requirement for any public subsidy during construction or operations (Metro would still retain costs of $520 million associated with pre-development activities, ROW acquisition, and construction monitoring). Delivery of the HDMC as a two-seat ride would require an upfront public subsidy of approximately $1.5 billion, or $900 million more than a standalone highway-only facility. The subsidy would be used to buy down the capital cost of the HDMC Project, reduce private financing requirements, and provide a pre-tax equity IRR of 14% to the concessionaire during operations.

The enhanced two-seat ride would require a public subsidy of $525 million, slightly lower than the $607 million required for the highway-only scenario. The rail component appears to cover all of its own costs, including capital, O&M, and lifecycle, but its self-sufficiency is reliant on highly favorable financing terms, specifically the availability of TIFIA and RRIF program loans in an unprecedented amount ($3.3 billion YOE) and at historically low interest rates. The enhanced two-seat ride reduces slightly but not measurably the subsidy needed for highway by less than $100 million.

Under all scenarios, the High Desert Multipurpose Corridor would deliver new HSR infrastructure at a lower total capital cost than would otherwise be incurred by the public sector under a traditional delivery, with additional benefits to the public sector, including increased ridership and revenues on Metrolink and CaHSR-operated services between Los Angeles Union Station and Palmdale. Incremental gross revenues on this segment attributable to the initiation of Palmdale to Victorville passenger rail service are estimated to total $6.5 billion YOE over the 50-year concession term. Assuming such revenues could be shared with or otherwise pledged to the HDMC project for financing purposes, it would enhance the viability of the rail component of the HDMC and, under an optimistic scenario, may even support cross-subsidization of the highway facility. A revenue-sharing agreement could also specify that any such revenues be used to offset or otherwise substitute for track access fees charged to the HDMC operator for use of the newly-upgraded Los Angeles to Palmdale HSR corridor.

Table 21 – Comparison of Financing Capacity for Capital Costs, by Project Scenario

Sources of Funds	One Seat	Two Seat	Enhanced Two Seat	Highway Only
Private Activity Bonds	-	-	-	824
TIFIA Proceeds	2,861	1,946	2,305	789
RRIF Proceeds	1,349	585	1,039	0
Equity	1,212	360	615	315
Interest Income	89	54	69	29
Total Private Financing	***5,511***	***2,945***	***4,028***	***1,957***
Construction Subsidy	**0**	**1,492**	**525**	**607**
Total Capital Cost	**5,511**	**4,437**	**4,553**	**2,564**
Construction costs	4,999	4,147	4,147	2,166
Financing costs	512	289	406	398
Debt to Equity Gearing	78:22	88:12	84:16	81:19

Compared to the freeway/tolled highway facility only, the inclusion of rail in the HDC enhances the financing capacity of the project as the result of three factors:

- **RRIF Program Eligibility.** Under a tolled highway facility-only project definition, the HDC is eligible only for the TIFIA program and is ineligible for RRIF, which finances up to 100% of eligible project costs for the rail component. Combined as a single project, the toll facility and passenger rail service can take advantage of both TIFIA and RRIF, thereby substantially increasing the eligible amount of project financing that can be obtained with federal credit assistance (ie. at below-market interest rates);
- **TIFIA Share.** The addition of the rail component is likely to enhance the competitiveness of the Project for the maximum 49% share of TIFIA financing to implement a multi-modal, energy-efficient corridor.
- **Excess Net Operating Income.** Assuming the one-seat ride scenario, with service from Los Angeles to Victorville as part of a service continuing to Las Vegas, excess net operating income could allow for the issuance of additional debt to cross-subsidize the construction costs of the tolled highway facility out of net revenue streams generated from the rail project.

The financial analysis results presented here are subject to the validation of the cost allocation assumptions outlined in **Section 4.3.2**. Any shifting of costs associated with either capital or service improvements on the Los Angeles Union Station to Palmdale segment of the Corridor onto the P3 concession, or any revenue-sharing agreements mandated by Metrolink or the CaHSR as a condition of track usage along this segment could substantially change the outcome of the analysis.

In addition, it should be noted that the share of private equity as a percentage of total project financing is markedly lower in Scenario 2 than the target "gearing" (debt to equity ratio) of 80:20 typically targeted in concessions involving revenue risk. An adequate level of equity contribution is important to ensure both long-term developer interest in the project and an opportunity for financial returns commensurate with the level of risk assumed. Even with an upfront construction subsidy, as the concessionaire continues to assume revenue risk during operations, a higher target equity IRR or availability payment structure (in which the Project Sponsor assumes revenue

risk and guarantees a minimum level of payment) may ultimately be required to attract private investment.

5.0 PROJECT RISKS

Undertaking a large and complex project such as the HDMC involves risks throughout the development and implementation of the project. It is critical to identify, manage, and mitigate risks at each stage of the Project.

This section identifies the high-level risks associated with the HDMC Project's successful execution and a description of specific risk mitigation, risk allocation, and risk management approach that Metro will need to apply to each identified risk. The risks associated with each of the general phases of the Project include:

- Development, ROW, environmental and permitting;
- Design and construction;
- Operational; and
- Funding, financial commercial and economic.

As a first step in the risk assessment and management process, the team prepared a risk register for each of the project delivery alternatives consisting of a list of potential risks to the successful development, construction and operation of the HDMC Project. The register included for each risk, its effect, its allocation to Metro or the concessionaire, its probability, its consequence and its impact. The risk register for the DBFOM alternative is presented in **Appendix B**. In each subsequent phase, this risk register will be continually updated with strategies to mitigate each of the key risks and the addition or removal of risks as each project phase progresses and the results will be incorporated into the RFP. For each risk/mitigation strategy, the project team will monitor the likelihood of the risk in order to ensure that the mitigation strategy is still valid in order to initiate mitigation efforts as needed.

At this level of analysis the allocation of specific project risks between Metro and the concessionaire at each phase of the HDMC Project is yet to be determined, but it is important to recognize that the level of risk transfer will have a direct impact on the bid price and hence financial viability of the Project.

This discussion provides an initial overview of the risk allocation and management approach that Metro will need to consider under a P3 delivery model for the HDMC.

5.1. Environmental Permitting

For transportation projects in the United States, environmental approval for construction entails significant risk of cost and schedule overruns that many concessionaires are reluctant to assume. The private sector has very little control over the process. The National Environmental Protection Act ("NEPA") and California Environmental Quality Act ("CEQA") laws encourage extensive studies, consideration of all alternatives and an inclusive process in which any one of numerous federal, state and local agencies can hold up or stop the process, add extraordinary mitigation requirements, and/or cause extensive rework or additional studies.

Therefore, this cost and schedule risk is best taken by the public sector. If the RFP is issued prior to completion of the environmental process with the project cleared for construction it is important that this risk be mitigated by appropriate scheduling or cost incentive provisions (stipends, for example) to encourage private interest in the project and to attract the most competitive bids.

Nevertheless, there would be significant advantages for the HDMC Project to overlapping environmental and P3 procurement activities. This could save considerable time in the process and would enable the concessionaire to have some latitude in project definition without necessarily requiring a supplemental environmental document.

5.2. Right-of-Way Acquisition Risks

For the HDMC Project, sufficient ROW will be required to accommodate the highway corridor and connecting roadways/interchanges on each end, the rail corridor (a two-track alignment) and, assuming that solar power is deployed in the corridor, something on the order of 100 acres of land for solar fields, either in a linear pattern along the corridor or in a concentrated pattern(s). Typically, the public sector is often best equipped to take the primary role in the ROW acquisition process. This is partly because eminent domain is a key power that public agencies can exercise to acquire ROW in a timely manner and at fair market prices. On the other hand, there are situations where the private sector can move more rapidly. The schedule for a major project such as HDMC is always critical so, as in several other P3 projects, a shared responsibility for ROW costs and the acquisition schedule may be the preferred approach. In this case, it may be less problematic than many other similar projects, since many parcels to be acquired are located in areas reserved by local agencies for the project or in non-developed land, or may be acquired early by the State for the base case alignment considered in this evaluation during the final design phase.

5.3. Design and Construction Risks

Design and construction risks are normally borne by the concessionaire. One primary advantage of design-build over the traditional design-bid-build is that it shifts the responsibility for the design/construction interface from the owner to the design-build contractor. It is unlikely that there will be controversy over the allocation of these risks. The contractor can control them and most experienced highway contractors will be willing to assume the responsibility. In addition, in a P3 arrangement the financing consortium casts another level of scrutiny to assure the best possible price.

5.4. Funding, Financing, Commercial Risks

5.4.1. Financing Risks

The financial analysis for the HDMC presumes a TIFIA commitment of nearly $2.5 billion over a 5-year period, with annual project drawdowns peaking at $579 million in FY 2018 under the one-seat scenario. A commitment of this scale would consume a sizable share of the program loan volume. The largest TIFIA loan approved to date is $900 million for the Central Texas Turnpike System. A $2.5 billion TIFIA loan commitment would be nearly three times that amount. It is reasonable to expect that FHWA, which administers the TIFIA program, is likely to apply exceptional scrutiny to a project application of this amount, even as its discretionary role in awarding TIFIA loans has been reduced under MAP-21.

A key consideration for Metro and its partners will be the impact of MAP-21 on the ability of the HDMC Project to obtain a TIFIA loan, without which the Project is unlikely to be financially viable as a P3 concession. With the elimination of project selection criteria formerly applied under

SAFETEA-LU[18], the Project's potentially enhanced competitiveness as a multimodal corridor compared to a tolled highway-only facility becomes less relevant. On the other hand, MAP-21 requires the TIFIA program to determine that TIFIA financial assistance will (1) "foster, if appropriate, partnerships that attract public and private investment for the project"; (2) "enable the project to proceed more quickly or reduce the lifecycle costs (including debt service costs) of the project"; and (3) "reduce the contribution of Federal grant assistance for the project."

Furthermore, the transformation of the TIFIA program under MAP-21 from a competitive process to a first-come, first-served basis means that the Project need only fulfill the program requirements and submit its application in a timely manner in order to secure credit assistance, assuming adequate program funds are available to cover the cost of assistance associated with the loan.

5.4.2. Commercial and Economic Risks

Early risks related to the commercial viability of the HDMC Project include:

- Shortages in available general and specialized contractors due to simultaneous execution of multiple mega-projects in the Southern California region, resulting in a lack of competitive bids and/or early withdrawal of bidders;
- Inability to obtain specified levels of performance or payment bonds;
- A sudden increase in Treasury rates from current historic lows;
- Volatility in foreign exchange rates, in particular the continued long-term weakening of the U.S. Dollar, which could reduce the financial attractiveness of the revenue streams derived from the Project to multinational contracting firms and infrastructure funds.

The viability of the project revenue-based financing approach assume the continuation of ultra-low interest rates on U.S. Treasuries, to which both the TIFIA and RRIF programs are indexed, through at least mid-2014, when the Project would reach financial close for an anticipated start of construction activities in early 2015.

5.5. Maintenance and Life Cycle Risks

Concessionaires experienced in working under toll concession DBFOM agreements will be well versed in taking on responsibility for ongoing maintenance and periodic R&R (life cycle) costs. It is possible to estimate reasonable annual and periodic maintenance costs over a long period of time meeting a specific maintenance standard such based on forecasted levels of traffic in case of the highway and train trips in the case of the rail. Often there is some type of risk sharing for force majeure events such as major earthquakes or floods.

5.6. Traffic and Revenue Risks

For any P3, the risk that future revenue will be sufficient to cover operating costs, long term maintenance and rehabilitation costs, debt service and a reasonable return on equity is significant. If the HDMC Project is done as a "pure" concession DBFOM, then the concessionaire would be responsible for all of capital, maintenance and operating costs of the project from the time the P3 agreement is executed.

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[18] Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

Even with a full concession approach, the public sector will likely incur significant costs prior to execution of the P3 agreement:

- Preliminary engineering;
- Environmental permitting;
- Feasibility studies;
- Legal and consulting costs to prepare the P3 agreement and procure the concessionaire;
- ROW acquisition – may be only early acquisition prior to the RFP or complete acquisition;
- Payments to utilities for relocation; and
- Certain off-site mitigation.

These costs are rarely recovered, but for a project in which forecasted revenues are higher than needed to cover operations and debt service, the upfront public investment can be recouped in several ways:

- The P3 agreement can include a provision that treats all, or parts of, the public investment as equity. This equity would be taken out of the project in a pre-defined ratio equal to the equity taken out by the concessionaire; or
- The P3 agreement can include a provision that treats all, or parts of, the public investment as deeply subordinated debt that is only repaid upon the occurrence of certain triggers such as exceeding a threshold limit of return on equity.

For a greenfield project such as the HDMC, however, there is an increased risk that actual revenues will not achieve the forecast revenues. Additionally, under the two-seat Ride Scenario, it is unlikely that the tolled segment and the rail component will have sufficient revenues to cover all of the estimated costs incurred by the concessionaire to build the entire highway component from SR-14 to I-15. As a result, Metro may have to contribute financially to the capital costs of the project to generate competition and attract concessionaires. Public financial participation could be provided to the Project in several ways:

- Funding for all ROW purchases and payments to utilities for relocation;
- Provide "fixed periodic payments" over the repayment period of the debt incurred to finance the initial construction. The amount of the periodic payment can be fixed by the agency in the procurement documents or be a bid item submitted by the proposers; or
- Provide lump sum payments to the concessionaire during the construction period based on certain milestones. This is most likely to be the case for the East and West Segments of the highway project.
- Some form of revenue guarantees for the highway and rail components to absorb or share losses below a threshold level. Such guarantees should be accompanied by provisions to share excess revenues above a predetermined level.

6.0 APPROACHES TO PROJECT DELIVERY

This section discusses an approach to delivering the HDMC Project as a P3. Under current law Metro has the ability to enter in to a comprehensive development lease agreement ("CDLA") with a concessionaire for development of the HDMC Project as authorized by Streets and Highways Code, Section 143 ("SB 4"). This is subject to selection and approval of the Project by California Transportation Authority ("CTC"). The schedule for delivery of the Project is driven by the environmental process and availability of public funding. The approach presented here accelerates the procurement to the extent compatible with the environmental approval process, conforms to existing legal requirements, and enables a selection of the concessionaire based on a best value selection.

The selection of the concessionaire will involve a three-step procurement starting with the industry outreach phase, followed by a prequalification process to narrow the field of potential proposers down to a short list of qualified teams to be allowed to submit priced proposals for the CDLA. The last step would be the final selection of the concessionaire team based on the best value to Metro and the public. The best value would include four components:

- The proposed technical approach, schedule and the price needed to allow the concessionaire to finance, design, build, operate and maintain the Central Segment of the HDMC as a toll road for 50 years.
- The proposed technical approach and price for design and construction of the West and East Segments when done in conjunction with the Central Segment.
- The proposed technical approach, concept of operations, schedule and the price to allow the concessionaire to finance, design, build, operate and maintain the high speed rail line along the HDMC.
- The amount of revenue support or revenue sharing bid by the concessionaire.

The CDLA will define the performance standards to be met by the project for both highway and railroad operations and maintenance over the life of the lease. It will define the rules for setting tolls and fares, define the level of rail service to be provided, and all reporting requirements. It will also define the process for the concessionaire to turn control of the Project back to the appropriate public agency at the end of the lease, including the minimum requirements for physical condition of the roadway, structures and traffic/toll collection systems that make up the toll road and the track, signals, traction power systems and other facilities and equipment that make up the railroad link. The manner of disposition of the rolling stock would also be defined in the CDLA.

6.1. Procurement Approach

A hypothetical expedited procurement schedule has been prepared based on the schedule for issuance of the final RFP linked to the public circulation of the draft EIR/EIS and the draft project report ("PR"). These two documents provide an official milestone of project definition that can be used as the basis for a construction cost estimate, estimate of operations and maintenance costs, and a traffic and revenue forecast. These are necessary components of the proposers' financial plans to enable a fixed price bid on the amount of subsidy needed for the HDMC Project. The draft EIR/EIS and PR become contract documents as part of the RFP to partially define the scope of the Project. The RFP will likely request two proposals; one technical to present the organization, project management approach and detailed plan for execution of the project; and the other to present the proposed financial approach, the prices for the end

segments and the amount of revenue support/sharing for the project. The financial proposal will be due approximately one month after the technical proposal is submitted. The design-build prices and the amount of subsidy identified in the financial plan submitted in the proposals will be the primary measure of price competition for concessionaire team selection.

A list of key milestones with anticipated dates is shown in **Table 22**. There is some float left in the schedule in anticipation that the environmental process does not proceed exactly as scheduled. This preliminary schedule is the basis of the analysis performed for this Study.

Table 22 – HDMC Project Preliminary Schedule

Activity	Anticipated Dates
Advance Preliminary Engineering to Define Concept	December 2012
Issue RFI	January 2013
Industry Outreach, RFI General Meeting, one-ones	January – March 2013
Issue RFQ	March 2013
SOQ Due Date	May 2013
Shortlisting announcement	July 2013
Issue Draft RFP for review by shortlisted teams	August 2013
Submit Request for P3 Selection to CTC with Project Proposal Report Prior to CTC Public Hearing	October 2013
CTC hold Public Hearing and Approve Project	January 2014
Issue Final RFP	February 2014
Record of Decision	Spring 2014
Issue Final Addendum to RFP	January 2014
Technical Proposal Due Date	February 2014
Financial Proposal Due Date	March 2014
Notice of Intent to Award	May 2014
P3 Agreement Final Form	June 2014
Metro hold Public Hearing	June 2014
Submission of P3 Agreement to PIAC and Legislature for 60-day review period	July 2014
Notice of award	September 2014
Execute CDLA	October 2014
Financial close	December 2014
Start of Design and Construction –West Segment	January 2015
Start of Design and Construction –East Segment	January 2015
Start of Design and Construction –Central Segment	January 2016
Start of Design and Construction – High Speed Rail Link	January 2016
Toll Operations Commencement – Central Segment	January 2020
Start of Rail Operations	January 2020

6.2. Legal Authority

Section 143 of the California Streets and Highways Code as amended by Chapter 2 of the Statutes of 2009 (Senate Bill 4, Second Extraordinary Session) ("SB 4") authorizes Caltrans and regional transportation agencies ("RTA") such as Metro to enter into CDLAs with public or private entities for public private partnership agreements. SB 4 further provides that P3 projects and associated lease agreements shall be submitted to the CTC, which shall select and approve projects before a further review process with PIAC and the legislature prior to execution of the final agreement. The authority for P3 under SB 4 sunsets on January 1, 2017, which means the CDLA would need to be executed prior to this date.

CTC has issued policy guidance for this procedure for P3 projects (Resolution G-09-13, passed October 14, 2009). This CTC guidance sets forth CTC's policy for carrying out its role in implementing P3 projects and assisting and advising Caltrans, RTAs, and private entities that may be contemplating the development of P3 agreements.

6.3. Metro's Role

This study assumes Metro leads the procurement of the CDLA with support from Caltrans. Once the CDLA is executed and an unlimited NTP is issued to the concessionaire, control of the Project shifts to the concessionaire. The roles and responsibilities of Metro and Caltrans, as well as their extent of control during project delivery and operations need to be clearly defined in the CDLA. The HDMC toll road will be part of the State highway network and Caltrans has a statutory duty to review and monitor design, construction, operations and maintenance of the Project to the level of detail required to ensure public safety. The rail link will be part of the US rail network subject to inspection and oversight by the Federal Railroad Administration ("FRA"). Metro and/or Caltrans will be entering in to the CDLA with the concessionaire. Their role is to administer the lease agreement to verify that both the concessionaire and Metro comply with all requirements of the lease agreement. Metro and Caltrans will only exercise review and approval rights over toll policies to the extent stated in the CDLA.

6.4. Process

This section summarizes the many parallel activities that need to occur to allow construction of the HDMC Project to begin by January 2015. Generally these activities fall into the following broad categories:

- Preliminary engineering and environmental studies;
- Approval process for delivery of the Project through a CDLA; and
- Procurement of the concessionaire.

The steps involved in this process are summarized below in chronological order.

6.4.1. Completion of Preliminary Engineering and Environmental Studies

Caltrans began work on the preliminary engineering and project approval and environmental documents ("PA&ED") for the East and West Segments in 2007. The entire Project now is being studied and will be presented in one environmental document. The Project will be cleared under both CEQA and NEPA. A new alternative to include high speed passenger rail as part of the project was added in April 2012. This has delayed circulation of the draft EIR/EIS and it is now expected in the summer of 2013 and a ROD is anticipated in June of 2014.

6.4.2. *Metro Board approval on Project Delivery Method*

A decision will need to be made by Metro on the approach to be used in delivering this project once it is approved under CEQA and NEPA. Other options would be to pursue it as several design-bid-build projects or as a one design-build project. Based on the work done to date including the work documented in this study, the best value for money to the public considering the trade-off between costs and risks among the three approaches is achieved through the P3 approach. This will be further confirmed following completion of a business plan, industry outreach and CTC approval process discussed below.

If the project delivery decision is made after the final CEQA and NEPA approvals are received, it would delay opening of this project by at least two years. This would substantially increase the costs, delay the collection of revenue and delay the accrual of the benefits of the Project to the community and the traveling public. State and federal laws allow proceeding with certain procurement and project approval activities prior to satisfying CEQA and NEPA requirements and a Metro decision on the delivery method is the first step.

6.4.3. *Initiate Industry Outreach and CTC Approval*

Metro Board approval to develop the Project through a P3 triggers the start of the procurement and the CTC interaction. The first of these would be industry outreach and initiation of discussions with the CTC staff for approval of the Project for development through a CDLA. Also at this step a more focused search for public funding and/or loan support would begin.

The initial step in the industry outreach consists of public announcements in industry publications requesting comments on the proposed project scope and delivery method along with a letter of interest to receive a future Request for Qualifications ("RFQ"). Individual companies will be allowed to respond without spending the time and effort (if they have not already done so) to form teams to pursue the Project.

Before the request for letters of interest ("LOI") is published, a project website focusing on P3 delivery of the HDMC will be set up. This website will need to contain the preliminary scope of the Project, the preliminary procurement schedule, the proposed general terms of the CDLA, a copy of the business plan and other relevant documents that may be available.

Following publication of the request for LOIs, Metro and its consultants will need to be available to meet one-on-one with prospective proposers to answer questions and get feedback for improvements to the proposed scope, delivery plan, terms, CDLA and procurement process. This feedback will need to be documented and appropriate suggestions reflected in the CDLA and procurement documents as they are prepared.

Based on the input from the industry and further analysis of the delivery options, a decision will need to be made on the structure of the CDLA and the financial plan.

While the information is being assembled for the P3 website, Metro will need to initiate discussions with the CTC staff to update them on the Project and to obtain the latest information on the administrative processes related to CTC approval of the HDC Project for development under a CDLA.

Under SB 4, a proposed P3 project must be submitted to CTC for selection before Caltrans/Metro begins a public review process for the final lease agreement. A project proposal report will need to be prepared by Metro and submitted to the CTC at least 45 days prior to the CTC meeting at

which this selection is desired. This report will present a quantified analysis of the costs and benefits of the Project. Along with the project proposal report, the final RFP along with all procurement and contract document attachments such as the CDLA and evaluation process and criteria will need to be submitted.

Once the project proposal report is submitted to the CTC, Metro, and its advisors, will continue to meet with CTC staff and consultants hired to review the application. These meetings will allow Metro to respond to questions and expand on information submitted with the application.

Pursuant to CTC policy guidance (Resolution G-09-13), CTC selects and approves each P3 transportation project (as defined in §143(a)(6),) through the adoption of a resolution at a regularly scheduled meeting (see § 143(c)(2) and clause 2 of the policy guidance).

Caltrans/Metro may engage in preliminary steps leading to the development of the draft agreement, including the general solicitation of statements of qualifications and the prequalification of contracting entities, prior to submitting the project proposal report (see clause 4 of the policy guidance). However, Caltrans/Metro shall not issue the final request for proposals, nor conduct a final evaluation of proposals, prior to CTC approval of the P3 Project (see clause 4 of the policy guidance). CTC must approve the Project, certify useful life determination (for Caltrans projects only), adopt evaluation criteria (if qualifications/best value is used) and review the draft agreement (§ 143(d)).

6.4.4. Prequalification Phase

During this phase, Metro will refine the procurement plan, identify a selection committee and project financial committee, and begin preparing the concessionaire selection criteria and request for qualifications. Project documents including a preliminary scope, procurement plan, and draft CDLA will be updated based on the information received from prospective proposers. After review and approval, the RFQ will be issued by Metro. It is anticipated that approximately two months would be allowed for the concessionaire teams to prepare and submit statements of qualifications ("SOQ"). These SOQs would be evaluated by a Metro selection committee and a list of prequalified concessionaires issued.

6.4.5. RFP Phase

Once the shortlist of proposers is issued, an updated draft of the RFP and proposed procurement and contract documents will be sent to the prequalified teams for review and comment. Approximately three months will be allowed for proposer reviews and comments. Confidential one-on-one meetings will be held with each team during this period to candidly discuss their issues related to the proposed CDLA and other documents. All comments received will be evaluated by Metro and the project team.

The final RFP will be issued after those comments deemed acceptable are incorporated into the procurement documents and the following conditions have been met:

- CTC approval of the project delivery method is received;
- FHWA approval to proceed with P3 procurement ahead of the ROD is received;
- A source of funding for the end segments and rail link has been identified and committed; and
- The draft EIR/EIS and draft Project Report have been circulated.

It is anticipated that approximately four months will be allowed for preparation of technical proposals, and five months for the financial proposals. The final addendum to the RFP, which is expected to include the final EIR/EIS and ROD, will be issued no later than 30 days prior to the technical proposal due date.

Evaluation of the technical portion of the proposals will begin by the Metro selection committee as soon as the proposals are received. The rankings will be held confidential until after the financial portion of the proposals are received and evaluated by Metro's project financial team. The scores from the technical evaluation and the financial evaluation will be combined with a predetermined (and public) weighting to rank the proposals on best value. Metro would then issue a notice of intent to award to the selected concessionaire.

6.4.6. *Finalization of the CDLA and Review by PIAC and Legislature*

Following concessionaire selection Metro would finalize the draft CDLA and at least 60 days prior to executing a final lease agreement submit the draft lease and any comments from the public hearing(s) to the legislature and PIAC for review. The legislature or Secretary of Business, Transportation and Housing may provide written comments to Metro within this 60-day period. Metro would be required to consider those comments prior to executing the final lease. However, Metro retains discretion with regard to executing the final lease and no approval from the legislature or PIAC is required.

If Metro finds it necessary or appropriate to make changes that alter the project scope, CTC expects that the agency will request approval of the change by submitting a supplement to the project proposal report setting forth a description of the change and the reasons for it. CTC will place a proposed project supplement on its agenda in sufficient time to allow action to be taken on the requested change within 45 working days after CTC receives the supplement.

6.4.7. *Financial Close and Start of Construction*

Once the CDLA is executed the concessionaire would submit the necessary documentation and close financing. The preliminary schedule used for this study assumes approximately two months from execution of the CDLA to financial close. This timing is controlled by the concessionaire and could vary. The timing of financial close can be accelerated by the concessionaire by completing all of the conditions required for closing during the sixty day period of PIAC and legislative review. In this case, financial close can occur immediately after execution of the CDLA. One caveat could be the status of the environmental approval; if the ROD was issued less than six months prior to execution of the CDLA and there are perceived threats of litigation, there may be an imposed condition to wait to close finance until six months from the record of decision when the NEPA window for lawsuits closes.

Design and construction can start as soon as funds are available to the concessionaire. For purposes of this business plan it is assumed design and construction starts in January 2015 on the West and East Segments and January 2016 on the Central Segment and rail facilities. It is also assumed that passenger rail service and toll operations in the Central Segment begin in January 2020.

7.0 FINANCING OPTIONS

7.1. 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. A recent example in December 2010 involved the Long Beach Court Building, a social infrastructure P3 deal, which reached financial close using a short term bank loan. A year prior, Port of Miami Tunnel reached financial close using a bank debt 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.

7.2. 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 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 2012). 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 toll concessionaire. 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.

7.3. Transportation Infrastructure Financing Innovation Act (TIFIA)

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 the following advantages:

- Long-term loans at the comparable U.S. Treasury yield (State and Local Government Series ("SLGS") rate plus one basis point) – 2.61% for a 35 year loan as of July 31, 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 backloading;
- 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.

To date, the credit assistance provided by TIFIA has been relatively modest, with annual program funding of $122 million. Under MAP-21, the program grows to authorized levels of $750 million in FY 2013 and $1 billion in FY 2014. The new TIFIA funding levels would support as much as $10 billion in project loans annually, compared with approximately $1.2 billion of annual lending capacity under prior law, a nearly eightfold increase in lending capacity. A TIFIA loan may now also cover up to 49 percent of total eligible costs (up from the current cap of one-third of total costs).

Additionally, MAP-21 removes the current use of evaluation criteria for project selection in the TIFIA program. Under SAFETEA-LU, TIFIA employed a robust set of eight evaluation criteria, including measures of environmental impact, use of new technology, and innovative project organization and delivery. To replace this selection process, MAP-21 transforms TIFIA into a first-come, first-served program with a rolling application deadline.

7.4. Railroad Rehabilitation Improvement Financing (RRIF)

The RRIF program is a revolving loan and loan guarantee program administered by the FRA. The program originally was established by the TEA-21, and was extended and substantially expanded by SAFETEA-LU. It is legislatively authorized to make up to $35 billion in loans. To date, only $1.6 billion of loans have been approved. Currently, XpressWest, the project sponsor for a high-speed rail service between Victorville and Las Vegas, has submitted an application to FRA for a $5.5 billion RRIF loan.

Funding from RRIF may be used to acquire, improve or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings, and shops. Funds also may refinance outstanding debt incurred for those purposes listed previously, or may be allocated to develop or establish new intermodal railroad facilities

Attractive interest rates, similar to those available under TIFIA, also exist under RRIF. This program is able to fund up to 100 percent of a project's eligible costs, allows for a five-year grace period, but unlike TIFIA requires the borrower to pay an up-front risk premium. The credit risk premium (to cover subsidy cost) on the RRIF must be paid up front by borrower and cannot be funded through the loan amount. This can be a substantial cost to the project, depending on the collateral and source of repayment.

Additionally, there is limited ability to structure back-loaded debt repayment or deferred repayment structures as loans are generally structured with mortgage-style amortizations.

A RRIF loan is typically in the senior lien position, but can also be subordinate to TIFIA loan (as is the case with the redevelopment of Denver Union Station) and combined with private-sector investment and financing.

7.5. Private Equity

Sources of private equity include financial institutions, pension funds, concessionaires and infrastructure funds. Equity providers usually provide the smaller share of funding, as compared to debt, averaging about 20% of the total project financing (See **Table 23**).

Table 23 – P3 Project Financing Leverages State Funds

Project	Public Financing ($ millions)		P3 Project Financing ($ millions)			Total	Close	% Equity of Total Project
	State Grant*	TIFIA**	PABs	Bank Senior Debt	Equity			
91 Express Lanes, CA	0	0	0	100	30	130	July 1993	23.1%
Dulles Greenway, VA	0	0	0	298	80	378	Sept. 1993	21.2%
South Bay Expy, CA	0	140	0	400	160	700	May 2003	22.9%
I-495, VA	409	589	589	0	350	1,937	July 2008	18.1%
SH-130, Seg. 5 & 6, TX	0	430	0	686	210	1,326	Mar. 2008	15.8%
I-595 (AP), FL	0	603	0	781	208	1,592	Feb. 2009	13.1%
Port of Miami Tunnel (AP), FL	100***	341	0	342	80	863	Oct. 2009	9.3%
North Tarrant Expy, TX	573	650	398	0	426	2,047	Dec. 2009	20.8%
I-635 LBJ Expy, TX	490	850	606	0	672	2,618	June 2010	25.7%
Denver Eagle Rail, CO	1,030^	280	396	0	55	2,046	Aug. 2010	2.7%
Jordan Bridge, VA	0	0	400	0	100	100	Jan. 2011	100%
Midtown Tunnel, VA	308	422	663	0	272	2,100^^	April 2012	13.0%
Total ^^^	**1,880**	**4,025**	**2,256**	**2,607**	**2,588**	**13,791**		**18.8%**

* excludes public development costs

** excludes capitalized interest

*** milestone payment

^ Federal Grant (FTA FFGA)

^^ includes estimated $362 million toll revenues to be collected on existing free tunnels during 5 year construction period.

^^^ total excludes Denver Eagle rail project

Source: Public Works Financing

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. At the same time, because private equity investors often take a more aggressive view of potential project revenues than the public sector, the inclusion of private equity investment in a Project allows the Project Sponsors to advance more money for construction of out of the same toll revenue stream than pure municipal debt financing would permit.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The fundamental conclusion of this analysis is that the addition of high-quality, high speed passenger rail service enhances the overall financial viability of a HDMC Project, assuming that the proposed XpressWest service is implemented between Victorville and Las Vegas and achieves the forecasted level of ridership. In fact, if a one-seat ride from Las Vegas is provided to LAUS along the future CaHSR alignment planned between Los Angeles and Palmdale (and subject to the assumptions identified below), the resulting multimodal transportation corridor from Palmdale to Victorville could be self-financed and self-supporting based on combined highway toll revenues and fare revenues from rail service.

Fare revenues under a two-seat ride scenario utilizing Metrolink service for the connection between Los Angeles and Palmdale are less robust and would increase the total construction subsidy required to deliver the multimodal corridor by approximately $900 million over that required for the highway only (HDC) scenario. However, it should be noted that even at this higher subsidy level, new HSR service between Palmdale and Victorville could be delivered at a lower overall cost to the public sector under a multimodal P3 delivery approach compared to the delivery of HSR service as a standalone, publicly-funded project.

The results for the "enhanced two-seat" ride scenario demonstrate that the connection between Los Angeles and Palmdale will be a critical generator of ridership and revenue for the Project. If this segment can be improved to provide high speed rail service levels as contemplated by the CaHSRA, the HDMC becomes much more viable as a self-financed project. In addition, the potential synergistic network impacts of adding HSR service between Palmdale and Victorville on the Los Angeles to Palmdale corridor could justify the negotiation of a revenue-sharing agreement between CaHSRA and the HDMC concessionaire, with some of the incremental revenues generated from HDMC-induced ridership pledged to support HDMC project costs.

This study also concludes that there is potential for the corridor to be self-sufficient in terms of energy generation, with solar energy developed in the corridor sufficient to power the trains and the electrical needs of the highway facilities. Such solar energy would reduce the operating cost of the trains by providing electrical energy approximately 20% more cost effectively than traditional sources (see **Section 2.4**).

Also, considered cost-effective, although not a major contributor to the financial viability of the overall project, are the development of a high voltage electrical transmission line through the length of the corridor and the development of an auto oriented rest area/plaza[19] approximately midpoint in the corridor. Other options were considered in this analysis but found unlikely to be cost effective, including a water conveyance system from the Mojave Aquifer intersected by the Corridor at its eastern end and linear wind turbines in the corridor.

Table 24 presents the components of the High Desert Multipurpose Corridor Project, which eliminates the capital funding gap during construction[20] under a "one-seat" ride scenario. (Metro would continue to retain costs associated with ROW, environmental, etc. estimated at approximately $520 million).

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[19] Revenues from a transmission line or the rest area were not developed in the analysis.
[20] High Desert Corridor Project Interim Business Plan, InfraConsult, June 2012

Table 24 – Components of HDMC

Project Component	Self-Financing	Contribution to Funding Gap Reduction
West Segment of Highway Corridor	NO	NONE
East Segment of Highway Corridor	NO	NONE
Central Segment of Highway Corridor	YES	MINIMAL to NONE
Rail Service in Corridor: 1 seat ride LA Union Station to Las Vegas	YES	STRONG*
Rail Service in Corridor: 2 seat ride LA Union Station to Las Vegas	NO	NO**
Rail Service in Corridor: Enhanced 2 seat ride LA Union Station to Las Vegas	YES	<$100M**
Solar Energy Development in the Corridor	YES	LIMITED***

*On the order of $1.0 billion

** see explanation above about the enhanced potential for obtaining a 49 percent share of TIFIA through a multimodal approach. Also, this scenario generates substantial revenue for the operator of the service between LAUS and Palmdale which is not included in the financial analysis for the Palmdale to Victorville segment.

*** see explanation above about the potential for reducing the operating cost of the trains by providing electrical energy approximately 20% more cost effectively than traditional sources

The feasibility evaluation undertaken herein is based on existing data and information, combining information and extrapolating as necessary to fill in gaps in the data. Additional analysis will be required as part of the procurement strategy phase for the project. The key assumptions upon which these conclusions are based include the following:

- **Accuracy of ridership and revenue forecasts**, which are modeled upon the Victorville to Las Vegas XpressWest rail service and were developed by some of the most reputable firms in the business (see **Section 4.2** of this report). Should the forecast levels of ridership fail to materialize for XpressWest, the financial viability of the HDMC would be proportionately impacted.

- **Assumption of the cost of track improvements for the Los Angeles - Palmdale corridor by the CaHSRA**[21]. If CaHSRA funding is unavailable, the excess financing capacity from the rail service would not be available to support construction of the East and West segments of the High Desert Corridor highway facility.

- **Availability of TIFIA and RRIF loans up to the statutory program maximums.** Given the total capital cost of the Project at over $4.0 billion, the amount of these loans would be unprecedented in size (See **Section 4.3** of this report). In addition, Metro's current policy is to seek a 33% share of TIFIA for its highway program, not the 49% share assumed in this financial analysis. That said, the Consultant Team believes a strong case could be made for seeking the maximum 49% TIFIA share for the HDMC based on its multimodal

[21] California High-Speed Rail Program Revised 2012 Business Plan, April 2012

character, innovative integration of clean energy components to power train operations, and overall economic development potential for the Antelope Valley / Mojave Desert region in Southern California.

- **Adequate market appetite for the level of equity participation required in a revenue risk, greenfield project** (See **Section 4.3** of this report).

- **Availability of early public funding for at least $520 million YOE in pre-development costs** (comprising ROW, environmental, planning etc.)

It is the recommendation of this feasibility evaluation that the development of a complete business case is warranted assuming that XpressWest achieves its financing and proceeds. The business case would include an evaluation and recommendation regarding governance structure for the corridor and procurement strategy.

Appendix A: Term Sheet and Cash Flow

Financing terms	Scenario 1: LAUS-VV	Scenario 2: PD-VV
Analysis term	50 year concession	50 year concession
Inflation	Construction: 3.5% O&M, Lifecycle, and Revenue: 3%	
Senior debt facility	**TIFIA Loan**	
Interest rate	3.00%	3.00%
Tenor	35 years	
DSCR	Min: 1.25x	
Repayment	5 year principal holiday 14 year interest holiday	
Upfront Payment for Credit Assistance [1]	3.26% of loan amount	
Fees	Cost of issuance: $750,000 Annual fee: $12,000 (real)	
Subordinate debt facility	RRIF (see below)	
Target gearing	70:30 debt to equity	80:20 debt to equity
Target pre tax equity rate of return	16%	14%
Facility type	**RRIF loan**	
Interest rate	3.00%	3.00%
Tenor	35 years	
DSCR	Min 1.10x	
Repayment	5 year principal holiday 10 year interest holiday	
Investigation Fee[2]	0.500% of loan amount, paid upfront	
Credit Risk Premium[3]	4.424% of loan amount, paid upfront	
Fees	none	

- Due to the limited appropriations available to the TIFIA program, USDOT allows qualified borrowers to offset the subsidy cost of credit assistance through an upfront payment to the TIFIA program.
- Defrays costs the FRA incurs in evaluating RRIF loan applications. May not exceed one half of one percent of the requested loan amount, payable at the time that application is submitted.
- Assessed on the entire RRIF loan amount. Unlike TIFIA, the RRIF program does not currently have an appropriation from Congress, hence the cost of credit assistance must be borne by the applicant, or another entity on behalf of the applicant, through the payment of the Credit Risk Premium (CRP). The CRP equals the net present value of expected losses due to default, delinquency, prepayment, interest rate subsidy, and other factors, and is scored by the federal Office of Management and Budget (OMB). As the CRP is assessed differently based on the profile of each loan applicant, it ranged widely for recent RRIF loans, from an anticipated 1.000 percent for Xpress West's $5.8 billion RRIF loan (currently under consideration) to 4.424 percent for Amtrak's $562.9 million RRIF loan to finance the purchase of 70 locomotives, spare parts, and improvements to the maintenance facilities. Under certain circumstances, unused credit risk premiums can be returned to projects that meet their financial obligations. To be conservative, this analysis assumed

the higher CRP and did not assume any reimbursement of the CRP to the Project Sponsor at the end of the loan term.

High Desert Multipurpose Corridor
One Seat Ride

Date	Toll Fare Revenues	Interest Income Earnings	O&M	Lifecycle	Cash Available for Debt Service	TIFIA Debt Service	Senior Lien DSCR	RRIF Debt Service	Total DSCR	Net Cashflow to Equity
										16.3%
2012										
2013	-	-	-	-	-					
2014	-	-	-	-	-	-				
2015	-	-	-	-	-	-				(223,257,024)
2016	-	-	-	-	-	-				(175,921,149)
2017	-	-	-	-	-	-				(291,996,016)
2018	-	-	-	-	-	-				(271,248,214)
2019	-	-	-	-	-	-				(249,668,699)
2020	331,003,995	2,812,159	(144,224,898)	(383,284)	189,207,971	(66,734,127)	2.84	(46,273,840)	1.67	76,200,004
2021	476,486,886	2,809,392	(159,230,482)	(383,284)	319,682,512	(66,734,127)	4.79	(46,273,840)	2.83	206,674,545
2022	512,171,900	2,805,709	(176,257,866)	(871,509)	337,848,235	(66,734,127)	5.06	(46,273,840)	2.99	224,840,267
2023	537,811,243	2,797,143	(182,244,019)	(1,638,077)	356,726,290	(66,734,127)	5.35	(46,273,840)	3.16	243,718,323
2024	563,430,736	2,781,211	(188,430,710)	(1,612,703)	376,168,535	(66,734,127)	5.64	(46,273,840)	3.33	263,160,567
2025	590,699,369	2,768,130	(194,824,582)	(1,638,277)	397,004,641	(66,734,127)	5.95	(89,463,554)	2.54	240,806,959
2026	618,589,595	2,758,047	(201,602,693)	(771,479)	418,973,471	(66,734,127)	6.28	(89,463,554)	2.68	262,775,789
2027	647,237,446	2,748,721	(208,612,148)	(2,831,680)	438,542,339	(66,734,127)	6.57	(89,463,554)	2.81	282,344,658
2028	676,748,143	2,713,543	(215,860,728)	(7,025,968)	456,574,990	(66,734,127)	6.84	(89,463,554)	2.92	300,377,308
2029	707,202,454	2,661,072	(223,356,472)	(7,266,095)	479,240,959	(148,254,433)	3.23	(89,463,554)	2.02	241,522,971
2030	738,671,193	2,603,385	(231,107,686)	(6,316,558)	503,850,333	(148,254,433)	3.40	(89,463,554)	2.12	266,132,346
2031	771,216,475	2,548,235	(239,122,952)	0	534,641,757	(148,254,433)	3.61	(89,463,554)	2.25	296,923,770
2032	804,901,646	2,658,620	(247,411,137)	0	560,149,129	(148,254,433)	3.78	(89,463,554)	2.36	322,431,142
2033	839,782,358	2,755,288	(255,981,403)	0	586,556,243	(148,254,433)	3.96	(89,463,554)	2.47	348,838,255
2034	875,914,783	2,743,556	(264,843,215)	(2,892,489)	610,922,636	(148,254,433)	4.12	(89,463,554)	2.57	373,204,648
2035	911,506,851	2,718,420	(274,006,352)	(3,406,490)	636,812,430	(148,254,433)	4.30	(89,463,554)	2.68	399,094,442
2036	948,351,373	2,696,007	(283,240,767)	(2,185,927)	665,620,687	(148,254,433)	4.49	(89,463,554)	2.80	427,902,700
2037	986,501,941	2,683,560	(292,782,642)	(3,131,018)	693,271,841	(148,254,433)	4.68	(89,463,554)	2.92	455,553,854
2038	1,026,006,418	2,631,690	(302,642,112)	(13,868,898)	712,127,097	(148,254,433)	4.80	(89,463,554)	3.00	474,409,110

2039	1,066,919,934	2,531,152	(312,829,647)	(13,872,348)	742,749,090	(148,254,433)	5.01	(89,463,554)	3.12	505,031,102
2040	1,109,299,011	2,441,431	(323,356,056)	(12,108,990)	776,275,397	(148,254,433)	5.24	(89,463,554)	3.27	538,557,410
2041	1,153,194,470	2,342,412	(334,232,502)	0	821,304,379	(148,254,433)	5.54	(89,463,554)	3.45	583,586,392
2042	1,222,219,334	2,557,083	(351,276,257)	0	873,500,161	(148,254,433)	5.89	(89,463,554)	3.67	635,782,174
2043	1,270,172,858	2,741,452	(363,080,624)	(6,191,528)	903,642,158	(148,254,433)	6.10	(89,463,554)	3.80	665,924,171
2044	1,319,850,338	2,701,273	(375,277,104)	(4,586,311)	942,688,195	(148,254,433)	6.36	(89,463,554)	3.97	704,970,208
2045	1,371,317,349	2,664,511	(387,878,601)	(2,894,851)	983,208,408	(148,254,433)	6.63	(89,463,554)	4.14	745,490,420
2046	1,424,637,393	2,641,409	(400,898,438)	(1,109,224)	1,025,271,140	(148,254,433)	6.92	(89,463,554)	4.31	787,553,153
2047	1,479,877,473	2,620,047	(414,350,375)	(13,383,004)	1,054,764,142	(148,254,433)	7.11	(89,463,554)	4.44	817,046,155
2048	1,537,106,566	2,508,620	(428,248,619)	(15,217,617)	1,096,148,950	(148,254,433)	7.39	(89,463,554)	4.61	858,430,963
2049	1,948,028,863	0	(442,607,843)	(11,467,375)	1,493,953,645	(74,127,216)	20.15	(89,463,554)	9.13	1,330,362,874
2050	1,657,817,908	0	(457,443,196)	(16,961,782)	1,183,412,930	0		0		1,183,412,930
2051	1,721,451,332	0	(472,770,323)	0	1,248,681,009	0		0		1,248,681,009
2052	1,787,371,689	0	(488,605,379)	0	1,298,766,310	0		0		1,298,766,310
2053	1,855,663,532	0	(504,965,046)	(8,503,845)	1,342,194,641	0		0		1,342,194,641
2054	1,926,409,031	0	(521,866,547)	(6,228,979)	1,398,313,505	0		0		1,398,313,505
2055	1,999,693,119	0	(539,327,670)	(3,835,021)	1,456,530,428	0		0		1,456,530,428
2056	2,075,609,105	0	(557,366,780)	(294,066,798)	1,224,175,526	0		0		1,224,175,526
2057	2,154,247,746	0	(576,002,842)	(311,079,910)	1,267,164,994	0		0		1,267,164,994
2058	2,235,702,875	0	(595,255,438)	0	1,640,447,437	0		0		1,640,447,437
2059	2,320,077,524	-	(615,144,787)	(308,005,463)	1,396,927,274	-		-		1,221,017,982
2060	2,407,471,991	-	(635,691,767)	(307,050,572)	1,464,729,652	-		-		578,651,605
2061	2,497,989,983	-	(656,917,935)	0	1,841,072,048	-		-		2,488,246,561
2062	2,591,745,308	-	(678,845,551)	0	1,912,899,757	-		-		1,920,713,513
2063	2,689,559,039	-	(701,497,598)	(161,131)	1,987,900,310	-		-		1,976,725,466
2064	2,781,808,743	-	(661,931,086)	(672,453)	2,119,205,204	-		-		2,100,722,335

Interest Income Earnings	O&M	Lifecycle	Cash Available for Debt Service	TIFIA Debt Service	Senior Lien DSCR	RRIF Debt Service	Total DSCR	Net Cashflow to Equity
								14.0%
-	-	-	-					
-	-	-	-	-				
-	-	-	-	-		-		(122,064,076)
-	-	-	-	-		-		(29,193,574)
-	-	-	-	-		-		(84,100,567)
-	-	-	-	-		-		(67,307,796)
-	-	-	-	-		-		(57,575,926)
2,812,670	(68,328,932)	(169,595)	60,083,287	(33,867,570)	1.77	(20,058,702)	1.11	28,775,290
2,811,446	(70,860,327)	(169,595)	122,467,292	(67,735,139)	1.81	(20,058,702)	1.39	34,673,450
2,809,816	(73,482,109)	(385,623)	146,763,410	(67,735,139)	2.17	(20,058,702)	1.67	56,353,366
2,806,026	(76,197,424)	(724,813)	156,333,518	(67,735,139)	2.31	(20,058,702)	1.78	67,242,234
2,798,976	(79,009,523)	(713,586)	165,557,361	(67,735,139)	2.44	(20,058,702)	1.89	76,970,511
2,793,188	(81,921,771)	(724,901)	174,460,372	(67,735,139)	2.58	(38,780,504)	1.64	62,166,636
2,788,726	(84,923,004)	(341,362)	183,654,851	(67,735,139)	2.71	(38,780,504)	1.72	76,632,275
2,784,600	(88,030,581)	(1,252,956)	191,545,750	(67,735,139)	2.83	(38,780,504)	1.80	59,298,558
2,769,034	(91,248,182)	(3,108,835)	198,545,287	(67,735,139)	2.93	(38,780,504)	1.86	45,092,387
2,745,817	(94,579,611)	(3,215,086)	207,747,448	(150,478,249)	1.38	(38,780,504)	1.10	0
2,720,292	(98,028,803)	(2,794,937)	217,650,846	(150,478,249)	1.45	(38,780,504)	1.15	0
2,695,889	(101,599,824)	0	230,139,992	(150,478,249)	1.53	(38,780,504)	1.22	0
2,744,732	(105,296,881)	0	240,144,727	(150,478,249)	1.60	(38,780,504)	1.27	217,002,719
2,787,506	(109,124,321)	0	250,404,570	(150,478,249)	1.66	(38,780,504)	1.32	46,748,132
2,782,315	(113,086,641)	(1,279,862)	259,619,234	(150,478,249)	1.73	(38,780,504)	1.37	63,029,790
2,771,192	(117,188,488)	(1,507,296)	270,182,834	(150,478,249)	1.80	(38,780,504)	1.43	44,182,336
2,761,275	(121,351,039)	(967,224)	281,919,852	(150,478,249)	1.87	(38,780,504)	1.49	91,443,260
2,755,768	(125,662,940)	(1,385,406)	293,041,917	(150,478,249)	1.95	(38,780,504)	1.55	98,351,091
2,732,816	(130,121,730)	(6,136,681)	300,177,299	(150,478,249)	1.99	(38,780,504)	1.59	67,612,010

2,688,330	(134,732,262)	(6,138,207)	311,937,146	(150,478,249)	2.07	(38,780,504)	1.65	55,183,628
2,648,631	(139,507,854)	(5,357,960)	324,844,945	(150,478,249)	2.16	(38,780,504)	1.72	134,146,340
2,604,817	(144,445,871)	0	342,711,672	(150,478,249)	2.28	(38,780,504)	1.81	155,237,411
2,699,804	(152,195,776)	0	362,442,179	(150,478,249)	2.41	(38,780,504)	1.92	165,504,301
2,781,384	(157,573,766)	(2,739,614)	373,363,923	(150,478,249)	2.48	(38,780,504)	1.97	132,848,095
2,763,605	(163,134,298)	(2,029,341)	388,078,447	(150,478,249)	2.58	(38,780,504)	2.05	177,856,986
2,747,339	(168,888,346)	(1,280,907)	403,286,905	(150,478,249)	2.68	(38,780,504)	2.13	207,087,802
2,737,117	(174,842,419)	(490,807)	419,014,359	(150,478,249)	2.78	(38,780,504)	2.21	226,657,333
2,727,665	(180,998,281)	(5,921,683)	429,015,254	(150,478,249)	2.85	(38,780,504)	2.27	236,594,682
2,678,361	(187,367,996)	(6,733,459)	444,101,747	(150,478,249)	2.95	(38,780,504)	2.35	303,057,161
-	(193,958,747)	(5,074,060)	811,189,358	(75,239,125)	10.78	(38,780,504)	7.11	651,458,663
-	(200,772,535)	(7,505,213)	474,144,782	-		-		444,442,993
-	(207,822,619)	0	499,233,410	-		-		489,876,039
-	(215,116,927)	0	517,399,074	-		-		502,259,613
-	(222,657,726)	(3,762,763)	532,323,444	-		-		507,790,777
-	(230,459,588)	(2,756,185)	552,562,889	-		-		539,464,557
-	(238,531,261)	(1,696,912)	573,520,056	-		-		565,947,716
-	(246,875,312)	(130,118,052)	465,693,093	-		-		459,416,548
-	(255,507,752)	(137,645,978)	479,474,601	-		-		379,331,490
-	(264,438,238)	(138,644,818)	500,526,995	-		-		298,168,383
-	(273,669,668)	(136,285,603)	525,713,801	-		-		350,003,024
-	(283,219,640)	(135,863,085)	549,761,440	-		-		444,904,392
-	(293,098,805)	0	710,076,653	-		-		1,343,571,113
-	(303,310,438)	0	735,394,060	-		-		388,860,378
-	(313,873,876)	(3,099,116)	758,501,309	-		-		395,226,402
-	(324,035,745)	(3,760,364)	785,106,382	-		-		771,012,242

High Desert Multipurpose Corridor
Concession – Enhanced Two Seat Ride

COVERAGES

Date	Toll Fare Revenues	Interest Income Earnings	O&M	Lifecycle	Cash Available for Debt Service	TIFIA Debt Service	Senior Lien DSCR	RRIF Debt Service	Total DSCR
2012									
2013	-	-	-	-	-				
2014	-	-	-	-	-	-			
2015	-	-	-	-	-	-		-	
2016	-	-	-	-	-	-		-	
2017	-	-	-	-	-	-		-	
2018	-	-	-	-	-	-		-	
2019	-	-	-	-	-	-		-	
2020	153,340,095	2,812,670	(72,396,540)	(169,595)	83,586,630	(33,867,570)	2.47	(20,058,702)	1.55
2021	229,198,874	2,811,446	(75,086,077)	(169,595)	156,754,647	(67,735,139)	2.31	(20,058,702)	1.79
2022	260,247,194	2,809,816	(77,871,830)	(385,623)	184,799,557	(67,735,139)	2.73	(20,058,702)	2.10
2023	274,839,261	2,806,026	(80,757,150)	(724,813)	196,163,323	(67,735,139)	2.90	(20,058,702)	2.23
2024	288,882,368	2,798,976	(83,745,505)	(713,586)	207,222,254	(67,735,139)	3.06	(20,058,702)	2.36
2025	302,806,805	2,793,188	(86,840,480)	(724,901)	218,034,612	(67,735,139)	3.22	(38,780,504)	2.05
2026	316,799,276	2,788,726	(90,030,042)	(341,362)	229,216,598	(67,735,139)	3.38	(38,780,504)	2.15
2027	330,976,215	2,784,600	(93,332,821)	(1,252,956)	239,175,038	(67,735,139)	3.53	(38,780,504)	2.25
2028	345,417,703	2,769,034	(96,752,741)	(3,108,835)	248,325,162	(67,735,139)	3.67	(38,780,504)	2.33
2029	360,703,010	2,745,817	(100,293,856)	(3,215,086)	259,939,885	(150,478,249)	1.73	(38,780,504)	1.37
2030	376,390,803	2,720,292	(103,960,360)	(2,794,937)	272,355,797	(150,478,249)	1.81	(38,780,504)	1.44
2031	392,521,937	2,695,889	(107,756,590)	0	287,461,236	(150,478,249)	1.91	(38,780,504)	1.52
2032	409,132,303	2,744,732	(111,687,029)	0	300,190,006	(150,478,249)	1.99	(38,780,504)	1.59
2033	426,254,546	2,787,506	(115,756,314)	0	313,285,737	(150,478,249)	2.08	(38,780,504)	1.66
2034	443,919,188	2,782,315	(119,969,238)	(1,279,862)	325,452,402	(150,478,249)	2.16	(38,780,504)	1.72
2035	462,155,390	2,771,192	(124,330,757)	(1,507,296)	339,088,529	(150,478,249)	2.25	(38,780,504)	1.79
2036	480,991,491	2,761,275	(128,756,093)	(967,224)	354,029,449	(150,478,249)	2.35	(38,780,504)	1.87

2037	500,455,391	2,755,768	(133,340,498)	(1,385,406)	368,485,254	(150,478,249)	2.45	(38,780,504)	1.95
2038	520,574,845	2,732,816	(138,081,282)	(6,136,681)	379,089,699	(150,478,249)	2.52	(38,780,504)	2.00
2039	540,644,554	2,688,330	(142,983,617)	(6,138,207)	394,211,060	(150,478,249)	2.62	(38,780,504)	2.08
2040	561,381,728	2,648,631	(148,061,772)	(5,357,960)	410,610,628	(150,478,249)	2.73	(38,780,504)	2.17
2041	582,812,845	2,604,817	(153,312,865)	0	432,104,797	(150,478,249)	2.87	(38,780,504)	2.28
2042	616,414,905	2,699,804	(161,554,637)	0	457,560,073	(150,478,249)	3.04	(38,780,504)	2.42
2043	639,703,243	2,781,384	(167,274,303)	(2,739,614)	472,470,710	(150,478,249)	3.14	(38,780,504)	2.50
2044	663,782,177	2,763,605	(173,188,349)	(2,029,341)	491,328,091	(150,478,249)	3.27	(38,780,504)	2.60
2045	688,680,744	2,747,339	(179,308,520)	(1,280,907)	510,838,655	(150,478,249)	3.39	(38,780,504)	2.70
2046	714,428,741	2,737,117	(185,641,755)	(490,807)	531,033,295	(150,478,249)	3.53	(38,780,504)	2.81
2047	741,056,781	2,727,665	(192,189,892)	(5,921,683)	545,672,871	(150,478,249)	3.63	(38,780,504)	2.88
2048	768,596,344	2,678,361	(198,965,837)	(6,733,459)	565,575,409	(150,478,249)	3.76	(38,780,504)	2.99
2049	1,148,714,215	-	(205,977,251)	(5,074,060)	937,662,904	(75,239,125)	12.46	(38,780,504)	8.22
2050	826,540,596	-	(213,226,222)	(7,505,213)	605,809,162	-		-	
2051	856,846,209	-	(220,726,934)	0	636,119,274	-		-	
2052	888,042,511	-	(228,487,844)	0	659,554,668	-		-	
2053	920,344,866	-	(236,511,317)	(3,762,763)	680,070,785	-		-	
2054	953,794,258	-	(244,812,946)	(2,756,185)	706,225,126	-		-	
2055	988,433,116	-	(253,402,062)	(1,696,912)	733,334,142	-		-	
2056	1,024,305,368	-	(262,281,345)	(130,118,052)	631,905,971	-		-	
2057	1,061,456,510	-	(271,467,931)	(137,645,978)	652,342,602	-		-	
2058	1,099,933,665	-	(280,972,115)	(138,644,818)	680,316,731	-		-	
2059	1,139,785,649	-	(290,796,933)	(136,285,603)	712,703,112	-		-	
2060	1,181,063,041	-	(300,961,214)	(135,863,085)	744,238,742	-		-	
2061	1,223,818,250	-	(311,476,319)	0	912,341,931	-		-	
2062	1,268,105,590	-	(322,345,678)	0	945,759,912	-		-	
2063	1,313,981,348	-	(333,589,983)	(3,099,116)	977,292,249	-		-	
2064	1,360,876,951	-	(196,304,016)	(3,760,364)	1,160,812,571	-		-	

Appendix B: Risk Register for DBFOM Toll Concession

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	ImpactDesc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
1	**Planning, Permitting & Approvals**																		
1.01	Permits and Approvals	Local, Regional, State (including CA PUC)and Federal (including FRA) permits and approvals are incomplete or rejected (EIS/EIR is at least two years away, although east and west segments have been developed further as separate projects) (pre award)	Final design delay while approvals are revised and resubmitted. Material changes in project scope to meet approval requirements could result in increased cost of re-design and construction. Applies to both in the same way (P3).	Public	3	Occasional	4	Critical	12	Undesirable										
1.02	ROW Acquisition	Unable to acquire ROW needed for roadway and interchanges (pre award)	Delay while eminent domain is enacted, increase in cost due to escalation during delay (lower impact in P3 option as Contractor responsible for "working around" litigated parcels. With both Public and P3, the Contractor may obtain access through Caltrans while property acquisition value is eventually set by judge. Palmdale: only 3 properties affected. (2 SFR, 1 Business)	Shared	3	Occasional	1	Negligible	3	Acceptable										
1.03	Coordination between Districts (Interagency Coordination)	Coordination between Metro, HDC-JPA, Caltrans District 7, Caltrans District 8, CAHSR, Metrolink and Cities of Victorville, Lancaster and Palmdale. Currently have a coordination group in place but risk is that this group disbands or does not achieve consensus on key decisions during development.	Leads to delays while decisions take excessive amount of time to resolve. Development cost increase if changes are made to decisions previously agreed and developed further.	Public	3	Occasional	4	Critical	12	Undesirable										
1.04	Scope Uncertainty	The defined project incorporates three segments that have been planned by different groups and different stages. The addition of high speed rail introduces a fourth source of project definition.	Continued uncertainty on scope may delay the project development phase and therefore procurement. This could have a significant impact on funding availability (timing) and also cost estimates.	Public	4	Probable	2	Marginal	8	Undesirable										

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	ImpactDesc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
1	**Planning, Permitting & Approvals (continued)**																		
1.05	Rail Connections	To have viable passenger rail service along the high desert corridor, there must be good rail connections at each end. This means XpressWest and CAHSR projects both need to be implemented.	Failure of either the XpressWest or CAHSR could make rail on the HDC not viable	Public	4	Probable	3	Serious	12	Undesirable									
2	**Legislative / Policy**																		
2.01	Environmental related Lawsuits / Third-party impacts	Litigation on the Environmental documents (pre award)	Litigation concerning the EIR must be filed within 30 days after approval of the EIR. Litigation regarding the EIS must be filed within 180 days after approval of the EIS. If action is filed prior to award Metro must decide whether to award or wait until litigation is resolved. Possible injunction may be granted which would lead to project delay and make it difficult to get financing. Delay while challenge is addressed. Potential cancellation of project.	Public	2	Remote	5	Catastrophic	10	Undesirable									
2.02	Environmental Regulations	Change in environmental requirements, e.g. more aggressive recycling of solid waste, increase in cost of landfill disposal, lower allowable noise threshold, and change to designation of materials from non-hazardous to hazardous, change to designation of drainage outfall areas as wetlands. (post award)	Recycling of multiple categories of waste impacts on cost of disposal with possibility of haulage by multiple operators. Such requirements are non-discriminatory and may be adopted by city, county or even Statewide.	Shared	2	Remote	2	Marginal	4	Acceptable									
2.03	Political	Change in political support during design including opposition to high speed rail	Delay while project is re-scoped to address issues, likely to result in increased costs if additional mitigations are introduced or new alignment is put forward. Major delay if re-scoping requires new environmental approval. Project could be cancelled.	Public	2	Remote	4	Critical	8	Undesirable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
2	**Legislative / Policy (continued)**																		
2.04	Security	Non-discriminatory Government security requirements are increased	Increased cost of new requirements	Shared	2	Remote	2	Marginal	4	Acceptable									
2.05	Engineering / Technical Requirements	Nondiscriminatory change to technical requirements such as: design codes for highways, track, rolling stock, structures, e.g. upgraded earthquake retro fit requirements	Additional costs to meet compliance, potential delay if requirements are applied retro-actively to completed facility	Shared	2	Remote	3	Serious	6	Acceptable									
2.06	Engineering / Technical Requirements	Discriminatory change to technical requirements such as: increased heavy truck payload, track speeds, rolling stock standards or multi-trailer use permitted	Additional costs to meet new requirements, potential delay if requirements are applied retro-actively to completed facility. Likely to be a relief event.	Shared	1	Improbable	3	Serious	3	Acceptable									
2.07	Change - Health and Safety	Nondiscriminatory change in Health and Safety Regulations (post award)	Non-discriminatory risk of more requirements being put in place in respect of working practices or handling existing or future materials. Also a risk that certain asset components such as roadway appurtenances and safety features may be deemed inadequate (safety barriers).	Private	2	Remote	2	Marginal	4	Acceptable									
3	**Design & Construction**																		
3.01	Design - Ground Conditions	Geological conditions envisaged at design stage prove inaccurate, relevant to design of structures.	Change to design of foundations resulting in delay and increased cost if strengthening is required.	Private	2	Remote	3	Serious	6	Acceptable									
3.02	Design Approval	Changes anticipated by Contractor not approved by State, FHWA, FRA and others. Design does not meet Caltrans (and industry) standards. Agency staff incapable of doing design reviews, exceptions, etc.	Delays in gaining design approval, approval of exceptions, potential re-design to conform resulting in increased cost and delay.	Private	2	Remote	3	Serious	6	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
3	**Design & Construction (continued)**																		
3.03	Construction Phasing	Phasing is poorly planned	Critical path activities cannot start on time resulting in increase in overall schedule for completion	Private	2	Remote	3	Serious	6	Acceptable									
3.04	Coordination with other Projects	Other project constructed in the same area, such as Desert Xpress, CAHSR and Metrolink.	Conflict of operations for access to site, staging, possible re-design, need for coordination meetings all results in increased time and cost.	Private	1	Improbable	3	Serious	3	Acceptable									
3.05	Railroad Interface	Potential railroad interfaces (SCLA rail spur, BNSF Railway XpressWest and Mojave Northern Railroad)	Resolution of interfaces requires time - impact on delay and cost	Private	3	Occasional	3	Serious	9	Undesirable									
3.06	Site Access	Construction vehicles and equipment cannot gain efficient access to and from site	Initial delays due to inefficient process then potentially increased cost of remedial plan, possible delay while stakeholders agree to solutions, possible resistance	Private	2	Remote	2	Marginal	4	Acceptable									
3.07	Contaminated Ground	Contamination exceeds expectations, muck disposal becomes very difficult.	Delay while contaminated water and soil is carefully removed in accordance with procedures.	Private	2	Remote	2	Marginal	4	Acceptable									
3.08	Hazardous materials Pollution	Major accident during construction involving Hazardous material or pollutant	Pollutant capture facilities not in place leading to unchecked contamination of surface and ground water courses.	Private	2	Remote	3	Serious	6	Acceptable									
3.09	Environmental Impacts	Environmental impacts during construction exceed those identified in EIR/EIS (air quality, noise, biological resources, water quality, e.g. Mojave River and wetlands, visual quality & aesthetics).	Re-design for increased mitigations and to avoid negative impacts in affected area results in delay and cost increase	Private	2	Remote	3	Serious	6	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mt Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
3	**Design & Construction (continued)**																		
3.10	Endangered Species	Discovery of threatened/endangered species habitat and/or new listing during bio-surveys. Have to comply immediately when new species is listed.	More species are being identified as being threatened with extinction and listed. Expansion projects will potentially face more detailed and higher permitting, approval and mitigation costs. If new species found after ROD then must stop. On SR125 butterfly found which was listed on Federel Registers - led to 2 year delay and $2m mitigation cost. The more impacting change is if there is a new listing.	Shared	2	Remote	4	Critical	8	Undesirable										
3.11	Historic/Cultural Resources	Discovery of monuments, antiquities and archaeological objects	Discovery and reporting of artifacts could cause delay while artifacts are studied and importance understood. Various other stakeholders may become involved in the project and cause further delay. Risk of re-design to avoid important locations.	Shared	3	Occasional	3	Serious	9	Undesirable										
3.12	Utilities Budget / Payment to Utility Companies	Utility works budgets and schedules are not agreed prior to contract award. Companies include Southern California Edison (SCE) and City of Los Angeles Department of Water and Power (DWP). Utility relocations are likely at east and west segments in more urbanized areas.	Utility budgets should be set before the procurement package goes out. Utility companies may be required to undertake works at their own cost, this can cause delays. If project has to fund relocations budget estimate needs to be made and included in project cost estimate. Can be complex if utility company is privately owned. Incorrect estimation of budget can result in actual costs being much greater.	Shared	2	Remote	2	Marginal	4	Acceptable										
3.13	Utilities - Delay	Utility relocations in urban areas are long lead items due to involvement of utility companies. Incorrect scheduling can occur if agreements are not secured in time. Actual schedules can vary from plan.	Delay to utility relocations with knock on effect on other preliminary works and start of main contract.	Private	2	Remote	2	Marginal	4	Acceptable										
3.14	Unforeseen Utilities	Unforeseen utilities found during construction of roadways and structures.	Railways, buried and miscellaneous power and other overhead line relocation leads to design change. Overhead and underground utility plans not taken or provided. Increased costs and delays for relocation on implementation of works. Metro obligated by law to assume risk of unknown main or trunkline facilities.	Private	2	Remote	2	Marginal	4	Acceptable										

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
3	**Design & Construction (continued)**																		
3.15	Utilities - Interruption	Utility interruption during construction	Unknown and unseen utilities can be damaged during construction activities resulting in disruption of services to local areas. Associated costs of compensation to commercial and residential third-parties.	Private	2	Remote	2	Marginal	4	Acceptable									
3.16	Utility Service	Issues related to connections to power lines for HSR traction power such as insufficient capacity, cost, schedule delays and CA PUC approvals.	Lack of generating capacity could stop the rail portion of the project. Other issues cause delay and/or cost increases.	Private	2	Remote	2	Marginal	4	Acceptable									
3.16	Drainage	Insufficient drainage during construction	Localized flooding adjacent to site results in protests and claims from residents and businesses resulting in delay while temporary drainage facilities are installed and cost if claims are valid.	Public	2	Remote	3	Serious	6	Acceptable									
3.17	Existing Infrastructure Condition	Condition of existing infrastructure is worse than envisaged in the design in areas where the new roadway connects with exdsting facilities.	Re-design and additional construction results in delay and increased cost	Private	1	Improbable	2	Marginal	2	Negligible									
3.18	Constructabilit y	Unforeseen constructability issues.	Conflict between aspects of design resulting in need for re-design and consequently increase in cost and delays	Private	1	Improbable	2	Marginal	2	Negligible									
3.19	Materials Quality	On site testing identifies materials that are below standard	Replacement of affected sections of construction result in increased cost and delay	Private	2	Remote	3	Serious	6	Acceptable									
3.20	Materials Supply	Materials supplier failure	New supplier has to be found resulting in initial delay while contract is negotiated plus re-scheduling to account for difference in travel time for materials to get to site - delay to critical path activities. New supplier may have higher rates so could also be a cost impact.	Private	2	Remote	3	Serious	6	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	ImpactDesc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
3	**Design & Construction (continued)**																		
3.21	Scope Change Initiated by Caltrans/Owner	Change in project requirements	Claim by contractor, increased cost of project, may require re-design. Possible delay.	Shared	3	Occasional	3	Serious	9	Undesirable									
3.22	Terrorism, War, Pandemic	Act of destruction or threat to operation of facility Insufficient preparedness for such events.	Potential to terminate or postpone project indefinitely.	Shared	1	Improbable	5	Catastrophic	5	Undesirable									
3.23	Earthquake	Earthquake occurs during construction.	Potential death or injury to workers; remedial work to repair damage resulting in cost and time delays; potential damage to constructed facilities requiring repair or replacement	Shared	2	Remote	3	Serious	6	Acceptable									
3.24	Performance - Main Contractor	Failure to construct according to design specification and required quality of works.	Work not completed on time, remedial works required. Costs increase and potentially termination of contract resulting in increased costs and delay while new contractor is procured.	Private	3	Occasional	3	Serious	9	Undesirable									
3.25	Performance - Supply Chain	Failure of supply chain partners to deliver services or products, e.g. due to limited availability and expertise.	Disruption and delays to construction schedule necessitate additional costs/resources to maintain or accelerate scheduled progress	Private	3	Occasional	3	Serious	9	Undesirable									
3.26	Contractor Financial Difficulty/Default	Contractor or subcontractors are unable to meet financial commitments on this project or across their business. Bonding companies may be required to complete project.	Contractor or subcontractor bankruptcy resulting in significant delay. Dealing with bonding company and lawyers would result in significant delays.	Private	2	Remote	4	Critical	8	Undesirable									
3.27	Labor Dispute	Dispute occurs between Unions and Authority over working conditions, pay etc.	Negotiations with unions result in delay to project	Private	2	Remote	2	Marginal	4	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
3	**Design & Construction (continued)**																		
3.28	Performance Dispute	Issues of dispute occur between the Authority & Contractor over performance of contractor or subcontractors during the construction of new works.	Claim later on.	Private	2	Remote	2	Marginal	4	Acceptable									
3.29	Contract Coordination	If different contracts are used (structures, ITS, etc.) discrepancies between contracts can create difficulties in completion. Applies to tolling, track, signals, electric traction.	Difficulties in completion of overlapping contracts can require rework, with resulting cost and schedule increases	Private	2	Remote	3	Serious	6	Acceptable									
3.30	Design and Construction Admin and Oversight	Poor oversight during design, poor oversight during construction, unforeseen level of oversight required by Federal, State / Local agencies	Poor design oversight can result in delays to approvals and costly re-design. Poor construction oversight (QA/QC) can result in unsafe conditions during construction and also during operation. Remedial measures can cause delay and serious incidents later on can have high impacts on cost and loss of toll revenue. Increased resources for oversight will have an increase in cost.	Shared	2	Remote	3	Serious	6	Acceptable									
3.31	Traffic Management	Unacceptable level of impact on public safety, road damage, air quality, noise and pollution in urban areas (Palmdale and Victorville) causes Authority to instruct change to processes. Less of an issue in the Central segment at I-15 and SR-14 Interchanges only.	An incident may result in temporary disruption to construction while incident is investigated, prevention plan is put in place, compensation claim could result in legal action and increased costs. Noise or air quality complaints result in remedial action at additional cost to the project. Damage repairs increase project cost.	Private	2	Remote	1	Negligible	2	Negligible									
3.32	Site Safety and Security	Site security requirements are under designed.	Increase in security requirements increases cost	Private	1	Improbable	2	Marginal	2	Negligible									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikrDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
3	**Design & Construction (continued)**																		
3.33	Testing & Commissioning	Constructed facilities are not approved for opening, including tolling system, lighting, ITS equipment, track, signals, & traction power	Cost to repair. Defect correction exceeds scheduled timeframe and float is insufficient resulting in delay to opening. Open without tolling or rail operations, resulting in loss of revenue.	Private	3	Occasional	2	Marginal	6	Undesirable									
3.34	Latent Defects	Defects are discovered post completion of new works	Additional costs to remediate and rehabilitate defects	Private	3	Occasional	3	Serious	9	Undesirable									
4	**Operations Phase**																		
4.01	Tolling Violations	Excessive toll violations due to failure of recognition equipment, transponders, enforcement, power cut.	Back office costs of staff to do the menual identification or requirement for new equipment. Perceived loss of toll revenue. Perception by financial community that toll violations are high makes it difficult to issue the bonds. Affects financial viability.	Private	2	Remote	2	Marginal	4	Acceptable									
4.02	Operation Center: tolling and rail road	Operations center fails to function, such as due to a power outage, loss of communication systems (internet, phone), or computer failure.	Delay and loss of toll and passenger rail revenue while systems are put back on line.	Private	2	Remote	2	Marginal	4	Acceptable									
4.03	Tolling Operations	Organizational and management inefficiency from provider of back-end Electronic Tolling Collection activities (Customer Service Center/Video Enforcement Processing Center).	Increased tolling/transaction costs	Private	2	Remote	3	Serious	6	Acceptable									
4.04	Tolling - System Latent Defects	Failure in tolling equipment whilst under maintenance warranty.	Loss in revenue due to failure in recognizing transponders.	Private	2	Remote	2	Marginal	4	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
4	**Operations Phase (continued)**																		
4.05	Tolling - New Technology	Statewide or regional adoption of a new electronic tolling solution. Interoperability requirements change or are made more stringent.	Costs to adapt and introduce any required technology would be incurred.	Private	1	Improbable	2	Marginal	2	Negligible									
4.06	Technical Requirements - Third Parties	Further residential, business and retail development along roadway requires construction of additional infrastructure, such as noise walls.	Environmental regulations change to expand noise management to all residential and commercial areas along the ROW or for new communities.	Private	2	Remote	2	Marginal	4	Acceptable									
4.07	Train Operations	Train performance including speed, schedule adherence & reliability does not meet plan.	Failure to provide reliable, on-time service will result in fewer trips and less revenue.	Private	3	Occasional	3	Serious	9	Undesirable									
4.08	Train safety	Accidents and/or injuries to passengers and employees	Accidents and injuries will halt or delay train service and result in increased claim costs and perhaps regulatory action by the FRA or CA PUC.	Private	1	Improbable	3	Serious	3	Acceptable									
4.09	Capital Maintenance - Roadway	Failure to carry out major maintenance on the roadway and structures	Deferred major maintenance results in more extensive and costly repairs or replacement which may exceed any maintenance reserve provided by the private partner (extensive full depth pavement replacement, bridge deck replacement, etc.)	Private	3	Occasional	3	Serious	9	Undesirable									
4.10	Capital Maintenance - Railroad	Failure to carry out major maintenance on railroad facilities and equipment	Deferred major maintenance can result in premature failure/replacement of rails, wheels, motors, electronic equipment and other components which increase cost and down time of track or equipment.	Private	3	Occasional	3	Serious	9	Undesirable									
4.11	Incidents - Highway	Major accident involving third party collision with Asset or vehicle to vehicle collision.	Road is deemed unsafe for use leading to closure until safety concerns are addressed - loss of toll revenue (<1% of toll revenue affected). Traffic congestion and diversion.	Private	2	Remote	2	Marginal	4	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	CunsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitCunsDesc	Impact	MitImpactDesc	Residual Risk
4	**Operations Phase (continued)**																		
4.12	Routine Maintenance - Roadway	Failure to carry out routine/planned maintenance can lead to more serious defects.	Can lead to more serious defects. Safety issue, congestion.	Private	3	Occasional	2	Marginal	6	Acceptable									
4.13	Routine Maintenance and Inspections - Railroad	Failure to carry out required inspections and routine maintenance can lead to regulatory action, operational downtime and increased capital maintenance costs.	Temporary shutdowns impact passenger traffic resulting in less revenue. Increased capital maintenance can cause overruns in capital cost.	Private	2	Remote	3	Serious	6	Acceptable									
4.14	Debris Removal	Debris on roadway or shoulder- reactive maintenance.	If debris is not removed it can cause accidents, injuries, potential loss of life and damage to property and the asset. Impact is loss of toll revenue while crashes are cleared up and cost associated with any proven liability against incident management service.	Private	4	Probable	1	Negligible	4	Acceptable									
4.15	Renewal, Upgrade and Rehab work - Roadway	Renewal, upgrade and rehab works restrict the flow of traffic	If works are not carried out at times when traffic is low such as at night then congestion may result in loss of toll revenue. Carrying out works at night has safety impact on maintenence workers and may also increase costs if labor laws require additional pay.	Private	2	Remote	3	Serious	6	Acceptable									
4.16	Adverse Weather	Severe natural or weather related events, e.g. flooding	Road is temporarily closed - loss of toll revenue. Will interrupt rail traffic if track is flooded or washed out.	Private	2	Remote	2	Marginal	4	Acceptable									
4.17	Hazardous Materials Contamination	Hazardous material release	Catastrophic releases of hazardous materials (unrelated to the proper environmental management of the assets themselves). Extraordinary releases of highly dangerous chemicals or nuclear materials require lengthy cleanups. Revenue loss not fully recovered	Private	2	Remote	2	Marginal	4	Acceptable									
4.18	Operations and Maintenance Staffing - Roadway	Limited availability of skilled resources or capability and experience is poor	Operation and maintenance of asset does not benefit from efficient and effective management resulting in unplanned and creeping cost escalation	Private	2	Remote	2	Marginal	4	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
4	**Operations Phase (continued)**																		
4.19	Operations and Maintenance Staffing - Railroad	Lack of experienced and certified railroad workers	Will require importing skilled and certified locomotive engineers, and maintenance of way workers plus an extensive training program. Could delay startup and will increase operating costs.	Private	4	Probable	2	Marginal	8	Undesirable									
4.20	Drainage and Ponding	Ponding on roadway due to misplaced and/or blocked drains.	If ponding is not removed it can cause accidents, injuries, potential loss of life and damage to property and the asset. Impact is loss of toll revenue while crashes are cleared up and cost associated with any proven liability against incident management service.	Private	2	Remote	3	Serious	6	Acceptable									
4.21	Flooding	Inadequate drainage.	Future weather patterns may result in more intense floods, damaging the assets or lessening usability through closures. Likely to be an Authority wide issue requiring investment in enforcement and management of land drainage regulations.	Private	2	Remote	3	Serious	6	Acceptable									
4.22	Flooding	Inadequate Flood-Prone Area Management by third-parties (Developed areas with concrete/asphalt surfaces and roofing have faster run-off) - applicable to future adjacent developments.	Floods damage the Asset or cause closures. Maybe an Authority wide issue requiring investment in enforcement and management of land drainage regulations.	Private	2	Remote	3	Serious	6	Acceptable									
4.23	Maintenance Standards	Change in operations and/ or maintenance standards for roadway and railroad.	Increased standards will increase cost and may cause loss of revenue if lane or track closure is required for unscheduled maintenance.	Private	2	Remote	3	Serious	6	Acceptable									
4.24	Latent Defects	Existence of Construction Defects post completion of new works	Increased costs to operate and maintain the asset.	Private	2	Remote	3	Serious	6	Acceptable									
4.25	Earthquake, War, Terrorism, Pandemic, Vandalism.	Incident with higher order of magnitude than design level.	Damage to roadway and track structures could result in debris striking vehicles and crashes. Roadway or track closure, extensive repairs.	Shared	1	Improbable	4	Critical	4	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
4	**Operations Phase (continued)**																		
4.26	Labor	Resistance to changes/reduction in labor	Challenges from unions/labor/syndicate concerning staff levels, benefits and wages.	Private	2	Remote	2	Marginal	4	Acceptable									
4.27	Utilities	Maintenance of utilities and structures passing over or adjacent to roadway (e.g. power lines).	Failure of third-party obligation to maintain utilities or structures affects usability of the asset. Safety concerns arise as damage may occur to rolling stock or customers' vehicles and occupants. Reliance on Authority and Federal Laws identifying third party public authority responsibility.	Shared	2	Remote	3	Serious	6	Acceptable									
4.28	Reliability of Electric Power	Utility companies may have temporary shortages of power or "brownouts"	Reduction in power availability may stop trains from operating and reduce passenger revenue.	Private	2	Remote	4	Critical	8	Undesirable									
4.29	Cost of Electric Power	Utilities may increase rates higher than anticipated	Cost of traction power would increase total operating cost above plan	Private	2	Remote	2	Marginal	4	Acceptable									
4.30	Environmental	Retroactive stormwater upgrade requirements. If stormwater management is implemented properly then the risk is remote.	Stormwater management of facilities and roadways identifies locations where current channels and pipes are inadequate. Reasons may arise from more intensive rainfall or faster run off from increased paving due to commercial or residential development.	Private	2	Remote	2	Marginal	4	Acceptable									
5	**Commercial/ Financial**																		
5.01	Cost Estimates	Cost estimates are inaccurate	Business case no longer applies, project may not be viable at higher cost, funding may be insufficient to allow the project to proceed.	Public	4	Probable	4	Critical	16	Unacceptable									
5.02	Traffic and Revenue Projections	Truck and car traffic usage are below projections, e.g. Southern California Logistics Airport is not developed, freight corridor is under-utilized, other routes remain attractive. Modeling is incorrect.	Toll revenue is lower than required for financial viability.	Private	4	Probable	4	Critical	16	Unacceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	ImpactDesc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
5	**Commercial/ Financial (continued)**																		
5.03	Rail Ridership Projections	Riders on the high speed rail are significantly below forecast	Passenger revenue would be insufficient to cover operating costs and an ongoing subsidy would be needed to continue rail operations.	Private	4	Probable	4	Critical	16	Unacceptable									
5.04	Construction Cost Escalation	Cost escalation exceeds that predicted	Cost increase	Shared	3	Occasional	3	Serious	9	Undesirable	Pre-contract - Public Risk Post-contract – Private Risk								
5.05	Construction Market Capacity	Insufficient Construction market capacity, e.g. if acceleration plans mean that several projects are constructed simultaneously. Includes subcontractors.	Construction of other facilities or general economic conditions may restrict capacity of the industry to be able to build the facility in the timeframe expected - result in delay and escalation cost increase.	Private	2	Remote	3	Serious	6	Acceptable									
5.06	Public Funding	Expected funding does not materialize when required	Project delayed until funding is resolved, increase in construction cost due to escalation in materials, labor and equipment, increased cost due to inefficiencies of unutilized equipment if funding problem occurs during construction	Public	3	Occasional	4	Critical	12	Undesirable									
5.07	Contract Failure / Dispute	Dispute between Metro/Caltrans and the Concessionaire company	Serious dispute can result in delay and cost increase due to legal representation and time needed for negotiations	Shared	2	Remote	4	Critical	8	Undesirable									
5.08	Market Change	Reduction in vehicle usage, e.g. reduced use of conventional gasoline/diesel powered vehicles. Economic growth is not as predicted.	Reduction in traffic volume and toll revenue. May increase ridership on the high speed rail	Private	2	Remote	2	Marginal	4	Acceptable									
5.09	Insurance	Availability, price reasonableness, change to policy during project development	Increased costs	Private	1	Improbable	2	Marginal	2	Negligible									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
5	**Commercial/ Financial (continued)**																		
5.10	Performance Bonds	Availability to meet applicable legal requirements based on construction capital cost	Risk to project is that performance bond in required amount is not available. This risk is very low since (a) the enabling legislation for highway DB projects allows the procuring agency discretion to set the bond amount, (b) the enabling legislation for highway concessions appears to provide discretion for the procuring agency both to set the amount and to allow the bond requirement to be passed through to the concessionaire's DB contractor, and (c) FHWA allows <100% bond provided that performance risk is addressed. To the extent that public funds will not be paid out until after completion, the need for performance bond is reduced. Current market availability is maximum $500 million. Industry considers 20% of construction price reasonable therefore limiting project size to $2.5 billion. Premiums for bonds are assessed on contract price NOT bond amount and therefore are high. This may be different for the rail portion of the project.	Public	1	Improbable	4	Critical	4	Acceptable										
5.11	Payment Bonds	Availability to meet applicable legal requirements based on construction capital cost	Risk to project is that payment bond in required amount is not available. This risk is very low since (a) the enabling legislation for highway DB projects allows the procuring agency discretion to set the amount, and (b) the enabling legislation for highway concessions appears to provide discretion for the procuring agency both to set the amount and to allow the bond requirement to be passed through to the concessionaire's DB contractor. This may be different for the rail portion of the project.	Public	1	Improbable	4	Critical	4	Acceptable										
5.12	Connecting Facilities	Connecting facilities are not built or are inadequate to provide anticipated traffic flow	Traffic cannot get onto facility as expected leading to loss of expected toll revenue	Private	3	Occasional	3	Serious	9	Undesirable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
5	**Commercial/ Financial (continued)**																		
5.13	Rail Connections	Rail connections at the ends of the HDC are not built or do not allow one-seat ride. Timing of the transfers discourages usage.	Reduced rail passenger revenue which may make the line infeasible.	Private	1	Improbable	4	Critical	4	Acceptable									
5.13	Competing Facilities	Traffic diverts to other facilities/free alternatives, including HSR.	Toll revenue is lower than required for financial viability but rail passenger revenue would be higher.	Private	2	Remote	3	Serious	6	Acceptable									
5.14	Lack of Competition	Lack of competition in the procurement process.	Low value for money for public sector.	Public	2	Remote	4	Critical	8	Undesirable									
5.15	Bidder Withdraws	One of the proposers withdraws from the procurement process.	Lack of competition for the remaining proposer(s), prices increase. Potential re-procurement of the project to improve competitiveness.	Public	2	Remote	4	Critical	8	Undesirable									
6	**Acceptance & Third Parties**																		
6.01	Local Public Opposition due to Environmental Concerns	Resistance to project in general and specific issues like the location of interchanges.	Delay while issues are addressed. Potential cancellation of project. Major impacts to schedule could result in increased costs. Disruption to construction schedule resulting in delays and increased costs	Shared	3	Occasional	2	Marginal	6	Acceptable									
6.02	Property related Lawsuits / Third-party impacts	Litigation relating to issues like property damage	Potential halt to construction until issue is resolved to avoid further damage. Property owners may request an injunction if Metro does not stop voluntarily.	Shared	2	Remote	2	Marginal	4	Acceptable									
6.03	Protest from Unsuccessful Proposer	Unsuccessful proposer challenges the evaluation process	Litigation against Metro. Delay in awarding the contract until litigation is resolved.	Shared	2	Remote	2	Marginal	4	Acceptable									
6.04	Professional Engineers in California Government (PECG) Lawsuit	PECG takes a lawsuit action against Metro if it believes Metro has done something not allowed by the statute	Increased cost and delay to the project. Unlikely to lead to termination.	Public	2	Remote	2	Marginal	4	Acceptable									

High Desert Corridor with High Speed Rail – P3 Project (DBFOM Toll Concession) Risk Register (continued)

Ref No	Generic Name	Description of Risk	Effect	Assignment	Probability	LikeDesc	Consequence	ConsDesc	Impact	Impact Desc	Strategy to Mitigate Risk	Mit Assignment	Probability	MitLikeDesc	Consequence	MitConsDesc	Impact	MitImpactDesc	Residual Risk
6	**Acceptance & Third Parties (continued)**																		
6.05	Tolling - Public Perception	Public and political resistance to tolling and/or high speed rail.	Protest during design and construction phase results in re-scoping and potential cancellation of project.	Shared	1	Improbable	3	Serious	3	Acceptable									
6.06	Public Opposition to Increased Traffic on Adjoining Facilities.	Concerns from residents in communities in Palmdale, Lancaster and Victorville regarding increased traffic, noise, pollution and environmental health concerns.	Intense opposition could cause major delays to schedule and could result in increased costs.	Public	2	Remote	2	Marginal	4	Acceptable									
6.07	Public Opposition to Cost	Concern that project costs outweigh benefits relative to other potential infrastructure investments.	Intense opposition could cause major delays to schedule and could result in increased costs.	Public	2	Remote	2	Marginal	4	Acceptable									
6.08	Public Opposition to Toll Rates or rail fares	Toll rates or passenger rail fares are set too high for users to value the facility over alternatives.	Users take alternative routes, such as SR 138, resulting in loss of toll and passenger rail revenue.	Private	2	Remote	3	Serious	6	Acceptable									